सत्यमेव जयते

INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI

I.A.R.I. 6

GIPNLK—4/JDIARI/60—16-3-61—5,000

PUBLICATIONS

OF

FIELD MUSEUM OF NATURAL HISTORY

BOTANICAL SERIES

VOLUME XVII

CHICAGO, U.S.A.
1937–1939

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

CONTENTS

PAGES

1. THE NORTH AMERICAN SPECIES OF RUMEX. *By* K. H. Rechinger, Jr. June 24, 1937 1–151

2. STUDIES OF AMERICAN PLANTS—VII. *By* Paul C. Standley. September 28, 1937 155–224

3. STUDIES OF AMERICAN PLANTS VIII. *By* Paul C. Standley. December 10, 1937 227–284

4. A CONTRIBUTION TO THE FLORA OF HONDURAS. *By* T. G. Yuncker. January 31, 1938 287–407

5. STUDIES OF THE AMERICAN FLORA—I. *By* Julian A. Steyermark. May 27, 1938 411–443

6. GENUS LABORDIA. HAWAIIAN EUPHORBIACEAE. LABIATAE AND COMPOSITAE. *By* Earl Edward Sherff. September 30, 1939 447–612

LIST OF ILLUSTRATIONS

PLATES

I. Typical view along the road in the interior of Honduras.
II. *a.* View of Siguatepeque, Honduras.
b. Hand-sawing pine logs into boards for use in local construction.
III. *Lycopodium arcanum* Maxon.
IV. *Anthurium basiattenuatum* Standley.
V. *Anthurium lucens* Standley.
VI. *Anthurium Yunckeri* Standley.
VII. *Thecophyllum montanum* L. B. Smith.
VIII. *Tillandsia glossophylla* L. B. Smith.
IX. *Tillandsia lampropoda* L. B. Smith.
X. *Tillandsia Yunckeri* L. B. Smith.
XI. *Piper faviculiferum* Trelease.
XII. *Calliandra arborea* Standley.
XIII. *Desmodium luteolum* Standley.
XIV. *Ilex Hondurensis* Standley.
XV. *Begonia Yunckeri* Standley.
XVI. *Achyrocline Yunckeri* Blake.
XVII. *Verbesina vicina* Blake.
XVIII. *Zexmenia perymenioides* Blake.

TEXT FIGURES

PAGE
1. *Rumex paucifolius* Nutt. 25
2. *Rumex hastatulus* Baldw. 29
3. Valves of (a) *Rumex venosus* Pursh, (b) *R. fascicularis* Small, and (c) *R. spiralis* Small 33
4. *Rumex verticillatus* L. 37
5. *Rumex floridanus* Meisn. 41
6. *Rumex altissimus* Wood 46
7. *Rumex ellipticus* Greene 51
8. *Rumex Berlandieri* Meisn. 53
9. Valves of (a) *Rumex mexicanus* Meisn., (b) *R. hymenosepalus* Torr., (c) *R. densiflorus* Osterh., (d) *R. pycnanthus* Rech. f., (e) *R. occidentalis* Wats. 57
10. *Rumex triangulivalvis* (Dans.) Rech. f. 59
11. *Rumex lacustris* Greene 67
12. *Rumex transitorius* Rech. f. 69
13. *Rumex pallidus* Bigel. 72
14. *Rumex sibiricus* Hultén 75
15. *Rumex utahensis* Rech. f. 77
16. *Rumex crassus* Rech. f. 81
17. *Rumex salicifolius* Weinm. 83
18. *Rumex californicus* Rech. f. 87
19. *Rumex orthoneurus* Rech. f. 97
20. *Rumex praecox* Rydb. 101

PAGE
21. *Rumex arcticus* Trautv. 109
22. Valves of (a) *Rumex fenestratus* Greene, (b) *R. Britannica* L., (c) *R. fueginus* var. *athrix* (St. John) Rech. f., (d) *R. fueginus* var. *brachythrix* Rech. f., (e) *R. fueginus* var. *ovato-cordatus* Rech. f., (f) *R. fueginus* var. *tanythrix* Rech. f., (g) *R. fueginus* form 111
23. *Rumex violascens* Rech. f. 133
24. *Rumex flexicaulis* Rech. f. 135
25. *Rumex persicarioides* L. 145
26. Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley and Steyermark 413
27. Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley and Steyermark 415

BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

VOLUME XVII NUMBER 1

THE NORTH AMERICAN SPECIES OF RUMEX

BY
K. H. RECHINGER, JR.
NATURAL HISTORY MUSEUM, VIENNA

B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BOTANY
EDITOR

PUBLICATION 386

CHICAGO, U.S.A.
JUNE 24, 1937

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

THE NORTH AMERICAN SPECIES OF RUMEX[1]

K. H. Rechinger, Jr.

INTRODUCTION

Among the North American species of *Rumex* are the following described by Linné: *R. Acetosa, R. Acetosella, R. alpinus, R. Britannica, R. bucephalophorus, R. crispus, R. dentatus, R. maritimus, R. obtusifolius, R. persicarioides, R. pulcher, R. sanguineus,* and *R. verticillatus.* Only four of these species are indigenous: *R. Acetosa, R. Britannica, R. persicarioides,* and *R. verticillatus.* All the others are introduced from Europe, except *R. dentatus,* which is originally from Asia, and most of them only a short time ago. The group of *R. salicifolius,* so characteristic for North America, is not represented among the Linnaean species.

The genus *Rumex* has been monographed only twice as a whole, by Campdera, in 1819, and by Meisner apud De Candolle, in 1856.

Campdera cites twelve species as occurring in North America: *R. persicarioides* L., *R. obtusifolius* L., *R. crispatulus* Michx., *R. sanguineus* L., *R. Kunthii* Campd., *R. verticillatus* L., *R. Claytoni* Campd., *R. aquaticus* L., *R. Acetosella* L., *R. venosus* Pursh, *R. crispus* L., and *R. ludovicianus* Raf. Three of them are indigenous, one confused, four introduced, one a synonym, and three doubtful.

Meisner notes twenty-two North American species and one hybrid: *R. aquaticus* L., *R. venosus* Pursh, *R. longifolius* DC., *R. crispus* L., *R. Kunthianus* Schult. f., *R. mexicanus* Meisn., *R. Berlandieri* Meisn., *R. chrysocarpus* Mor., *R. floridanus* Meisn., *R. Britannica* L., *R. salicifolius* Weinm., *R. verticillatus* L., *R. conglomeratus* Murr., *R. sanguineus* L., *R. obtusifolius* L., *R. crispo-obtusifolius* Meisn., *R. brevipes* Meisn., *R. persicarioides* L., *R. crispatulus* Michx., *R. maritimus* L., *R. Acetosella* L., *R. Engelmanni* Meisn., and *R. Acetosa* L. Ten of the species are indigenous, six introduced, two synonyms, two confused, and two doubtful.

Trelease in 1892 published a *Revision of the species of Rumex occurring north of Mexico.* He mentions twenty-one species: *R. Acetosella* L., *R. hastatulus* Baldw., *R. Geyeri* (Meisn.) Trel:, *R.*

---

[1] Vorarbeiten zu einer Monographie der Gattung Rumex V. Previous numbers of the series have been published as follows: I. Beih. Bot. Centralbl. 49, Abt. 2. Dresden, 1932. II. Repert. Sp. Nov. 31. Berlin, 1933. III. Arkiv Bot. 26A, No. 3. Stockholm, 1933 (South American species). IV. Oesterr. Bot. Zeitschr. 84. Wien, 1935 (Australian species).

Acetosa L., *R. venosus* Pursh, *R. hymenosepalus* Torr., *R. occidentalis* Wats., *R. Patientia* L., *R. Britannica* L., *R. crispus* L., *R. verticillatus* L., *R. floridanus* Meisn., *R. altissimus* Wood, *R. salicifolius* Weinm., *R. Berlandieri* Meisn., *R. conglomeratus* Murr., *R. sanguineus* L., *R. pulcher* L., *R. obtusifolius* L., *R. persicarioides* L., and *R. bucephalophorus* L.

Since Trelease's paper there have been published fourteen other North American species and some varieties, all by American authors: (*R. Bakeri* Greene), (*R. confinis* Greene), *R. densiflorus* Osterh., *R. fascicularis* Small, *R. fenestratus* Greene, (*R. gracilipes* Greene), *R. hesperius* Greene, *R. lacustris* Greene, (*R. Langloisii* Small), (*R. polyrhizus* Greene), *R. praecox* Rydb., (*R. procerus* Greene), (*R. salinus* A. Nels.), *R. spiralis* Small. The names in parentheses do not seem to me to be valid and appear in this paper as synonyms or varieties. Most of these species have been mentioned in their respective local floras, but for the most part no one has undertaken to define their systematic position, consequently a new general revision of the North American species of *Rumex* seems desirable.

In the present paper forty-nine species and four hybrids are recorded from North America, including Mexico, of which thirty-five species are indigenous and twelve introduced; as regards a few species it is not quite certain whether they are really introduced. Among the alien species are ten or eleven of European and Mediterranean origin, one from South America, and one from eastern Asia.

Special attention should be called to the fact that only three spontaneous hybrids are recorded from North America; in only one of them does an indigenous North American species take part, the two others being of introduced European parents. In striking contrast, there are known in Europe several dozens of hybrids, and many of them occur frequently wherever the parents grow together.

Thirty of the thirty-five indigenous North American species are endemic: that is, are not found naturally outside the continent. The range of the five remaining species is as follows: two are arctic-circumpolar (with interruptions), one (or perhaps two or three, since the question whether they are spontaneous in the New World is not solved) is widely spread over the temperate zone of the northern hemisphere, and one species ranges widely over North and South America, with wide interruptions in the tropical regions.

Seven species and one hybrid are described by me. A large part of the increase in number of species is due to division of the collective species *R. salicifolius* in the sense of earlier authors. By courtesy of

American institutions, I have been able to study extensive material, which has shown that the number of more or less distinct types in the relationship of *R. salicifolius* is rather large and that most of them are confined to definite areas. That these areas are natural ones, that is, correlated with climatic and geographic-geologic facts, is scarcely open to discussion, since similar areas have been defined frequently by American workers for genera not particularly susceptible to extraneous influences, such as that of man (see Fernald, Persistence of plants in unglaciated areas of Boreal America, Mem. Gray Herb. 2. 1925).

I acknowledge my great indebtedness to the directors of many American and European institutions and their staffs for liberal loans of important collections. A list of the herbaria follows:

Be.	Botanisches Museum, Berlin-Dahlem, Germany.
Br.	Botanisches Institut der Masaryk-Universität, Brünn.
Bu.	Botanische Abteilung des National Museums, Budapest.
Ca.	University of California, Berkeley.
Ch.	Field Museum of Natural History, Chicago.
Cl.	Botanisches Institut der Universität Cluj, Roumania.
Co.	Columbia College, New York (containing the Meisner Herbarium).
De.	Herbier Delessert, Conservatoire Botanique, Geneva.
G.	Gray Herbarium, Cambridge.
H.	Botanisches Staatsinstitut, Hamburg.
Ke.	Royal Botanic Gardens, Kew.
Ko.	Botanisches Museum der Universität, Copenhagen.
La.	Rocky Mountain Herbarium, Laramie, Wyoming.
Le.	Botanischer Hauptgarten, Leningrad.
Lu.	Botanisches Museum, Lund, Sweden.
Mu.	Botanisches Museum, Munich.
MW.	Botanische Abteilung des Naturhistorischen Museums, Vienna.
NY.	New York Botanical Garden, New York.
O.	Herbarium of Geological Survey of Canada, Ottawa.
P.	State College of Washington, Pullman.
St.	Botanische Abteilung des Reichsmuseums, Stockholm.
SL.	Missouri Botanical Garden, St. Louis.
Up.	Botanisches Museum, Upsala.
Ut.	Botanisches Museum, Utrecht.

UW. Botanisches Institut der Universtität, Vienna.
Wa. United States National Herbarium, Washington.
Z. Botanisches Museum der Universtität, Zürich.

Among the numerous friends who have aided in various ways in preparation of this work I thank especially Dr. Harold St. John for many most helpful suggestions regarding literature and location of American collections and for geographical data; Dr. Theodor Just, for photographs of Greene types; and Dr. Frida Rechinger for the drawings. J. Francis Macbride helped me kindly in matters of phraseology.

NATURAL ARRANGEMENT OF SPECIES

From my standpoint the indigenous and more important introduced American species of *Rumex* may be separated into the following subgenera, sections, and subsections:

SUBGEN. I. *Acetosella* (Meisn. apud DC. 63. 1856, pro sectione) Rech. f.

Flores dioici (vel polygami); perigonii florum foeminorum folia interiora fructificationis tempore non dilatata vel nuce ad summum 2-plo maiora, omnino ecallosa. Folia saepe hastata vel sagittata.—*R. Acetosella* L., *R. graminifolius* Lamb.

SUBGEN. II. *Acetosa* (Campd. 1819, p.p.; Meisn. apud DC. 64. 1856, pro sectione) Rech. f.

Flores dioici vel polygami; perigonii florum foeminorum folia interiora fructificationis tempore nuce deinde pluries maiora, ecallosa vel basi callo minuto recurvo praedita. Folia in multis speciebus hastata vel sagittata.—*R. Acetosa* L., *R. thyrsiflorus* Fingerh., *R. paucifolius* Nutt., *R. hastatulus* Baldw.

SUBGEN. III. *Lapathum* (Campd. 1819; Meisn. apud DC. 42. 1856, pro sectione) Rech. f.

Flores omnes vel plurimi androgyni. Perigonii foliola interiora (valvae) fructificationis tempore nuce pluries maiora ecallosa vel callifera. Callus nunquam recurvus. Basis foliorum inferiorum cuneata vel rotundata vel cordata, nunquam hastata vel sagittata.

Sect. A. *Axillares* Rech. f., sect. nov.

Perennes. Caules ex axillis foliorum infra inflorescentiam primariam ramos foliosos serius elongatos et florentes proferentes. Rami inflorescentiae plerumque singuli. Valvae ecallosae vel calliferae in plurimis speciebus integrae. Folia in plurimis plana, basi rotundata vel cuneata.

Subsect. a. *Venosi* Rech. f., subsect. nov.

Monotypica. Descriptio *R. venosi* Pursh.

Subsect. b. *Verticillati* Rech. f., subsect. nov.

Pedicelli fructiferi perigonio maturo pluries longiores, rigidi, prope basin geniculato-articulati.—*R. verticillatus* L., *R. floridanus Meisn.*, *R. fascicularis* Small.

Subsect. c. *Salicifolii* Rech. f., subsect. nov.

Pedicelli fructiferi perigonio maturo non vel ad summum 1.5–2-plo longiores, in medio vel prope basin articulati.—*R. spiralis* Small, *R. altissimus* Wood, *R. ellipticus* Greene, *R. mexicanus* Meisn., *R. Berlandieri* Meisn., *R. triangulivalvis* (Danser) Rech. f., *R. lacustris* Greene, *R. transitorius* Rech. f., *R. pallidus* Bigel., *R. sibiricus* Hultén, *R. utahensis* Rech. f., *R. crassus* Rech. f., *R. salicifolius* Weinm., *R. californicus* Rech. f.

Sect. B. *Simplices* Rech. f., sect. nov.

Annui, biennes vel perennes. Caulis simplex ex axillis foliorum infra inflorescentiam ramos foliosos serius elongatos et floriferos non proferens.[1] Rami inflorescentiae singuli vel fasciculati. Valvae ecallosae vel calliferae, integrae vel vario modo dentatae. Folia plana vel crispata, inferiora basi cuneata vel rotundata vel cordata.

Subsect. a. *Hymenosepali* Rech. f., subsect. nov.

Monotypica. Descriptio *R. hymenosepali* Torr.

Subsect. b. *Densiflori* Rech. f., subsect. nov.

Rhizomate horizontali perennantes.[2] Valvae callosae. Folia inferiora basi cuneata vel rotundata vel cordata, plerumque in medio latissima.—*R. densiflorus* Osterh., *R. pycnanthus* Rech. f., *R. orthoneurus* Rech. f., *R. praecox* Rydb.

Subsect. c. *Aquatici* Rech. f. Repert. Sp. Nov. 31: 232. 1933, in nota.

Radice verticali perennantes. Valvae ecallosae. Folia inferiora basi saepe cordata, in plurimis speciebus infra medium latissima.—*R. occidentalis* Wats., *R. arcticus* Trautv., *R. fenestratus* Greene.

Subsect. d. *Patientiae* Rech. f. Repert. Sp. Nov. 31: 230. 1933.

Perennes. Folia latitudine 2–4-plo longiora, inferiora in medio circiter latissima, basi leviter cordata vel rotundata vel cuneata. Petiolus supra planus. Valvae rotundato-cordatae, amplae, saepius integrae, una plerumque callifera.—*R. Patientia* L.

---

[1] Exceptions: (1) If the principal stem is damaged; (2) in overnourished individuals; (3) in some hybrids.

[2] Several species could not be examined in regard to this character.

Subsect. e. *Crispi* Rech. f., subsect. nov.

Perennes. Folia latitudine 3–6-plo longiora, crispa, basi cuneata, in medio circiter latissima. Petiolus supra canaliculatus. Valvae rotundato-cordatae, saepius integrae, omnes vel una callifera. Pedicelli perigonio maturo 1.5–2.5-plo longiores.—*R. crispus* L.

Subsect. f. *Conglomerati* Rech. f., subsect. nov.

Perennes. Folia inferiora latitudine usque 3-plo longiora, basi cordata. Rami inflorescentiae singuli, arcuato-divergentes. Florum glomeruli omnes remoti. Pedicelli perigonio maturo usque 1.5-plo longiores. Valvae parvae integrae linguiformes, una vel omnes calliferae.—*R. conglomeratus* Murr., *R. sanguineus* L.

Subsect. g. *Hydrolapatha* Rech. f., subsect. nov.

Perennes. Folia basi cuneata, plana acuta, consistentia rigida subcoriacea, longitudine usque 5-plo longiora, nervis secundariis angulo recto vel subrecto a primario abeuntibus. Pedicelli fructiferi rigiduli, perigonio maturo usque 2.5-plo longiores. Valvae omnes calliferae integrae. Calli fusiformes.—*R. Britannica* L.

Subsect. h. *Obtusifolii* Rech. f., subsect. nov.

Perennes. Folia basalia basi cordata plana longitudine ca. 2-plo longiora. Pedicelli fructiferi perigonio maturo 1–2.5-plo longiores, in vel infra medium articulati. Valvae una vel omnes calliferae saepius dentatae.—*R. obtusifolius* L., *R. pulcher* L.

Subsect. i. *Dentati* Rech. f., subsect. nov.

Annuae (vel biennes?). Folia inferiora basi leviter cordata vel rotundata vel late cuneata, in vel supra medium latissima longitudine usque 2 (–3) -plo longiores. Valvae saepius dentatae saepius omnes calliferae.—*R. dentatus* L., *R. violascens* Rech. f.

Subsect. k. *Maritimi* Rech. f., subsect. nov.

Annuae (vel biennes?). Folia inferiora linearia vel lineari-lanceolata longitudine usque 6-plo longiora plana vel crispata basi leviter cordata vel truncata vel cuneata. Valvae saepissime longe dentatae omnes calliferae.—*R. maritimus* L., *R. fueginus* Phil., *R. persicarioides* L., *R. flexicaulis* Rech. f.

GENERAL DISCUSSION OF SECT. AXILLARES

Among the most important new data regarding the taxonomy of the genus *Rumex* that I obtained while studying the North American species is the genetic connection of the species of *Lapathum* with axillary branching (sect. *Axillares*). Since the section has in North America its principal area of distribution and probably its most

important center of development, this subject may be discussed here in detail.

Species of *Lapathum* which regularly show leafy axillary shoots, generally producing in normal development secondary inflorescences that often predominate in the principal inflorescence, exist in important number (except in North America) only in South America (*R. argentinus* Rech. f., *R. chrysocarpus* Mor., *R. patagonicus* Rech. f., *R. andinus* Rech. f., *R. chiloensis* Rech. f.). Outside the New World such species appear only in separated geographic regions, in Australia (*R. Brownii* Campd.), in the Hawaiian Islands (*R. giganteus* Ait. and *R. albescens* Hildeb.), in eastern Asia (*R. yungningensis* Samuelsson, *R. sibiricus* Hultén), in South Africa (*R. Ecklonianus* Meisn.), in central Africa (*R. afromontanus* T. Fries). In Europe and in the greater part of Asia the section *Axillares* is absent, but in Europe there have been found adventive during the last decades two American species of sect. *Axillares*, subsect. *Salicifolii*.

The habit of the North American *R. venosus*, the South American *R. cuneifolius*, and the New Zealand *R. neglectus*, with widely extended, creeping, rhizome-like stem which emits sooner or later axillary shoots, can no doubt be considered a modification of the axillary type.

The opinion is surely acceptable that all the mentioned species outside America (except *R. sibiricus*, which belongs to subsect. *Salicifolii*) are relics of ancient lines of development. Most of the New World descendants, on the contrary, have partly kept their freshness of life and their power of accommodation. Many of them are in full development and have been able to occupy new land during alterations in distribution of land and water that took place in recent geologic periods, and they are still able to invade and inhabit regions deprived by man of their original vegetation.

The shape of the fruiting perigonium segments exhibits all the possibilities of this genus. The tendency to enlarge the surface is more or less occasionally—even exceedingly—prominent (*R. venosus* Pursh has the largest existing valves). At the same time the nervation is developed very differently, stronger or delicately graduated (*R. venosus*), or in nets of very different shape in the middle and the border of the valves. The midnerve is either not thickened (especially in the species with important development of the surface of the valves) or only little thickened, or it is transformed on one valve or all three to a smaller or larger grain of oblong, globular-ovate, or spindle-like form of the most different nature. Nevertheless the characteristic shape of the grain and its proportion to the surface of the valve remain in narrow limits for every species.

The *Axillares* show little tendency toward dentation on the margins of the valves; it is developed considerably only in one species, the Australian *R. Brownii*, and in that to an extreme degree. Among the American *Axillares* only *R. californicus* shows small teeth. Some others have now and then weak and irregular notches on the margins of the valves.

The isolated systematic position of the extra-American species as relics of an ancient group or groups, as mentioned above within the *Axillares*, as well as of the South American *R. Lorentzianus* Lindau and the North American *R. venosus*, can be expressed best by making each the representative of a subsection, while the other South American species may be grouped in two subsections (*R. cuneifolius* Campd. and *R. argentinus* in the first; all the other mentioned South American species in the second). Among the North American *Axillares* the species with very long pedicels (*R. verticillatus* L., *R. floridanus* Meisn., *R. fascicularis* Small—Subsect. *Verticillati*) differ clearly from the mass of all the others—Subsect. *Salicifolii*.

Among the *Salicifolii*—which derive their name from the species first described but previously not well interpreted, *R. salicifolius* Weinm.—three species differ from all the others by the size of the valves and by ovate-lanceolate, elegantly cuspidate leaves (*R. spiralis* Small, *R. altissimus* Wood, *R. ellipticus* Greene).

Rumex lacustris Greene, confined to Oregon, occupies a separate position because of its aquatic habit and its papillous-pubescent terrestrial form. *R. salicifolius* Weinm. nec al. and *R. crassus* Rech. f., both confined to California, have fruiting perigonia with one valve almost completely covered by an extraordinarily prominent grain. With the first is associated, as a parallel species without grains, *R. californicus* Rech. f., with shallowly dentate valve margins. The New England and eastern Canadian *R. pallidus* Bigel., which reappears in Alaska, has well developed grains, but of an oblong shape, and they do not cover the whole surface of the valves. This species is closely related to the east Siberian *R. sibiricus* Hultén, the only extra-North American representative of the *Salicifolii*. *R. transitorius* Rech. f., indigenous in the northwestern United States, lies morphologically between the Californian species and *R. pallidus*. *R. mexicanus* Meisn., *R. Berlandieri* Meisn., and *R. triangulivalvis* (Danser) Rech. f. have small grains in proportion to the valves; among these three *R. mexicanus* has the largest valves and nutlets and is in the strict sense, as I understand it here, in contrast to Fernald in Rhodora 10: 17. 1908, restricted to Mexico. *R. Berlandieri* also inhabits Mexico, besides the southern United States eastward as far as Louisiana. Among other features, it is characterized by rather small and obtuse, undulate leaves, by scrobiculate, nervose valves of compact structure, and by remote whorls. Because *R. Berlandieri* was misinterpreted by American authors, especially Trelease, who evidently had not seen Meisner's type, the same species has been described a second time as *R. Langloisii* Small. I designate as *R. triangulivalvis* the form resembling and closely related to *R. mexicanus* Meisn. but constantly differing by smaller valves and nutlets, which was identified by Fernald (loc. cit.) with *R. mexicanus*. Its home is southeastern Canada and the northeastern and middle United States. It is apparently the only species of this group that has been introduced into Europe. It appears in a scarcely differing form in the mountainous western states: var. *oreolapathum* Rech. f. This mountain race of *R. triangulivalvis* finds a parallel species without grains in *R. utahensis*.

Thus the numerous species of *Salicifolii* cover the whole North American continent except the arctic and subarctic regions and the southeast (Florida and adjacent states), and extends northwest to Asia.

Herewith there is given for the first time an essay of a demarcation and general characterization of this peculiar group. There is no doubt that the group *Salicifolii* is a natural one; but how far I have succeeded in the taxonomic arrangement of species—without the field study and cytological investigations essential for such critical groups—will become apparent later. The group *Salicifolii* does not show any geographic arrangement in the sense that it is represented in each region by only one species. In the south as well as in the west, several well-differentiated types grow close together. This fact could be interpreted as pointing to a great independence of these types. If in most cases I have chosen binary names for the representatives of the *Salicifolii* it has been not only for that reason, but also for practical considerations. In treating polymorphous groups I have the conviction that the supposed, mostly plastic or versatile parental connection of the various members is better expressed in a discussion rather than invested with precipitate, so to speak, assumptions that necessarily become on paper complicated clumsy formulae of dogmatic character. Yet it can not be denied that when taxonomic changes become necessary with the progress of knowledge, binary names are easier to handle than more complex ones.

Schematic essays of classification, especially when based exclusively on cultivated material and without any attempt to consider the results of research based on study of wild forms, as those of Danser, Nederl. Kruidk. Arch. 415. 1925, can only be considered as an expedient for the very first phases of systematic inquiry and should never be stated in a taxonomic way.

To friends of the broader limitation of species and of the clumsier nomenclatorial apparatus bound to it I wish to indicate, nevertheless, how some of the species accepted by me could, conceivably, with greater knowledge of them than is available at present, be united to form collective species, and also which species will resist, in my opinion, any condensation, under all circumstances.

R. spiralis will remain separated. *R. altissimus* and *R. ellipticus* may well be united. *R. lacustris* will probably remain a separate entity but it may be that it could be connected with *R. hesperius*, with western forms only incompletely understood by me of which I have had only incomplete or inadequate material. I should not be astonished if *R. crassus* were a diploid or multiploid race of *R. salicifolius*. These two species, and perhaps also *R. californicus* as a grainless parallel race of the latter with denticulate valves, could eventually be united. *R. pallidus* and *R. sibiricus* should be united. It remains doubtful whether *R. transitorius* has to be joined with *R. salicifolius-crassus*, *R. sibiricus-pallidus*, or with *R. mexicanus-triangulivalvis* because of its intermediate position. *R. Berlandieri* will better remain separated. *R. mexicanus* and *R. triangulivalvis*, including var. *oreolapathum*, may be united with *R. utahensis* as a grainless mountain form. On the other hand, *R. utahensis* resembles in some of its forms *R. californicus;* both are grainless and both seem to meet in the Californian mountains and then are not to be distinguished with certainty. As indicated, they seem to be of different origin.

The history of the *Salicifolii* is short. *R. salicifolius* was the first group to be described, and its name was used during a long time for all or at least almost all the species of this group. It was used also by Trelease in this wide sense. Meisner, when establishing *R. mexicanus* and *R. Berlandieri*, seemed not to have a clear conception of their parental position. The name *R. mexicanus* came to connote a special entity by Fernald, as he used it for a form widely spread over the middle, northern, and eastern United States. This form is really closely related to *R. mexicanus* Meisn., but differs by slight, although constant characters in the size of the valves and nutlets. The name *R. Berlandieri,* on the contrary, has never been used in the correct sense since Meisner's treatment, especially owing to Trelease's misinterpretation of it. Under this name generally has appeared a species of a quite different group (*R. violascens* Rech. f.); in a widely circulated exsiccatum (Pringle), also *R. conglomeratus.* Again the plant named by Meisner was described a second time as *R. Langloisii* Small, but the latter author made a valuable discovery with *R. spiralis.* I have not seen any type specimen of *R. altissimus* Wood, consequently I have used the name as Trelease and most American authors do, although I am not quite convinced that this conception is right.

Danser's classification of the *Salicifolius* group (see above) is based purely on the study of cultivated and introduced plants. He distinguishes two subspecies, ssp. *triangulivalvis* and ssp. *angustivalvis,* and three varieties, var. *trigranis,* var. *unigranis,* and var. *nudivalvis.* Subsp. *triangulivalvis* var. *trigranis* corresponds to the most widespread type and is treated in the present paper as a species. Subsp. *angustivalvis* var. *unigranis* corresponds to *R. salicifolius* Weinm., nec aliorum. Danser's observations on the development of *R. salicifolius* (op. cit. 423) are of special interest and of great influence on the natural arrangement of the genus, viz., (1) *R. salicifolius* does not develop radical leaves; (2) though perennial, it is able to flower in the first year if circumstances are not too unfavorable; (3) it does not go through a resting period after maturity of the principal fruiting panicle, but develops axillary branches below the principal panicle during its ripening. When the second one is ripening, the fruits of the first are falling off, and so on until the frost comes.

KEY TO SPECIES

Flowers dioecious or polygamous; leaves hastately lobed (except species 5 and sometimes 6). Subgenera *Acetosa* and *Acetosella.*

Valves rarely enlarged, as large or at most twice as large as the nutlet. Subgenus *Acetosella.*

Leaves short, oblanceolate, hastate, with usually large basal lobes; panicle amply branched; valves very small, not larger than the nutlets, without grain and without distinct nervation.............................1. *R. Acetosella.*

Leaves narrow, linear, without or with small basal lobes; panicle sparse; valves of nearly double the size of the nutlet. 2. *R. graminifolius.*

Valves enlarged, distinctly overtopping the nutlet. Subgenus *Acetosa.*

Leaves narrowed at the base, never with hastate lobes. 5. *R. paucifolius.*

Leaves with hastate lobes.

Stems robust; leaves usually cordate-oblong; valves about 5 mm. wide (see also 4. *R. thyrsiflorus*)...3. *R. Acetosa.*

Stems slender; leaves narrow, usually variable in shape; valves about 4 mm. wide..............6. *R. hastatulus.*

Flowers usually androgynous; leaves never hastately lobed. Subgenus *Lapathum.*

Stems erect, ascending, or procumbent, with axillary shoots. Sect. *Axillares.*

Valves wider than 20 mm., grainless, with a fine, double reticulation; ocreae wide, conspicuous............7. *R. venosus.*

Valves much smaller, at most 15 mm. long; ocreae smaller, appressed. Subsect. *Salicifolii.*

Pedicels (2–) 2.5–5 times longer than the fruit.

Stems slender, low; leaves broad and short, at most twice as long as broad, often still shorter, the nerves forming an angle of about 80° with the midnerve. 10. *R. fascicularis.*

Stems tall, robust; leaves at least 3 times longer than broad, the nerves forming an angle of about 45° with the midnerve.

Panicle open; pedicels conspicuous, 3–5 times longer than the fruits, these yellowish; valves rarely as broad as long, or narrower; leaves 5–7 times as long as broad.........................8. *R. verticillatus.*

Panicle rather dense; pedicels relatively inconspicuous, (2–) 2.5–3 times longer than the fruit; ripe fruits dark; valves often broader than long; leaves 3–5 times as long as broad.............9. *R. floridanus.*

Pedicels at most twice as long as the fruit.

Valves 7–8 mm. long, 8–12 mm. broad.....11. *R. spiralis.*

Valves much smaller.

Leaves ovate-lanceolate, broadest below the middle; valves more than 4.5 mm. long. 12. *R. altissimus* and 13. *R. ellipticus.*

Leaves usually narrower, lanceolate or linear-lanceolate, but if exceptionally broad, the fruits much smaller.

Valves grainless.

Stems slender but rigid, relatively tall, abundantly branched; leaves narrow; fruiting panicle large, open; valves rather distinctly denticulate. 24. *R. californicus.*

Stems thickish, mostly low, little branched; leaves broader; fruiting panicle small, very compact; valves a little crenulate at the base, nearly entire........................21. *R. utahensis.*

One valve or all grain-bearing.

Grains occupying nearly the whole breadth of the valve (the margin of the valve is on both sides of the grain narrower than the grain).

Valves relatively large, 4–5 mm. long; leaves 2–3 times longer than broad......22. *R. crassus.*

Valves much smaller; leaves narrower.

Valves very small, 2.3–3 mm. long, only one with a grain............23. *R. salicifolius.*

Valves larger, all with grains.

Valves 3–4 mm. long, scarcely longer than the grains, yellowish; nutlets about 2.5 mm. long.
19. *R. pallidus* and 18. *R. transitorius.*

Valves 2.5–3 mm. long, distinctly longer than the grains, brownish; nutlets scarcely 2 mm. long..............20. *R. sibiricus.*

Grains much narrower than the breadth of the valves (the margin of the valve is on both sides of the grain at least as broad as the grain. Compare also 25. *R. cuneifolius*).

Valves very small, 2.1–2.5 mm. long, with small grains; plants occurring in a broad-leaved, subglabrous, submersed state and in a narrower-leaved, papillate, emersed state.
17. *R. lacustris.*

Valves usually more than 3 mm. long; plant never living submerged; leaves longer and narrower, never papillate.

Leaves small and thickish, in the dry state olive-green, often undulate, somewhat obtuse, with strongly prominent nerves beneath; panicles interrupted; most whorls remote. 14. *R. Berlandieri.*

Leaves larger, rather thin, in the dry state pale green, acute; nerves scarcely prominent; fruiting panicle not interrupted, or only in the lower part.

Valves about 4 mm. long; nutlets about 2.5 mm. long............15. *R. mexicanus.*

Valves about 3 mm. long; nutlets about 2 mm. long..............16. *R. triangulivalvis.*

Stems usually erect, without axillary shoots.

Valves grainless, at most one of them with a diminutive, globular suggestion of a grain (*R. domesticus*), entire or finely and indistinctly erose-crenulate, rarely finely denticulate (*R. pycnanthus*).

Valves more than 10–16 mm. long; leaves gradually narrowed; ocreae large, persistent...........26. *R. hymenosepalus.*

Valves much smaller; ocreae delicate, caducous.

Plants with a vertical root.

Valves broad, rounded, nearly reniform, often broader than long, one sometimes with a diminutive, globular grain; leaves broadest at the middle, at the base abruptly narrowed, occasionally subcordate, the margin mostly undulate..........32. *R. domesticus.*

Valves roundish-ovate or cordate, often a little longer than broad, never with a suggestion of a grain.

Stems low; panicle not branched or with few short branches; leaves thickish, mostly narrowed on both sides; valve nerves thickish but indistinct; whole plant often with a purple tinge. 34. *R. arcticus.*

Stems tall; fruiting panicle usually compound; leaves mostly cordate at the base, but their shape most variable; valve nerves fine and distinct.

Valves more than 7 mm. long....35. *R. fenestratus.*

Valves to 5 mm. long...........33. *R. occidentalis.*

Plants with a creeping rootstock (compare also 31. *R. alpinus*).

Plants low; all leaves blunt, never more than twice as long as broad . . . . 30. *R. praecox.*

Plants tall; only the earliest leaves, if any, short and blunt, all the others about 3 times longer than broad, pointed.

Lateral leaf nerves forming a right angle with the midnerve; valves small, about 4 mm. long. 29. *R. orthoneurus.*

Lateral leaf nerves forming an acute angle with the midnerve; valves larger, 5–6 mm. long.

Valves nearly twice as long as broad, narrow, triangular, very pointed, rather distinctly denticulate near the base . . . . 28. *R. pycnanthus.*

Valves as long as or only a little longer than broad, scutiform, indistinctly crenulate-denticulate to entire . . . . 27. *R. densiflorus.*

At least one valve with a distinct grain.

Valves entire.

Leaves broad, flat, the nerves forming almost a right angle with the midrib; grain oblong, much longer than broad. 40. *R. Britannica.*

Leaves narrower, the nerves forming an acute angle with the midrib; grain ovate-oblong, at most 1.5 times longer than broad.

Leaves small, flat, and truncate; valves very small, scarcely broader than the thick grains; whorls remote, nearly all with leaves (compare also 39. *R. sanguineus*) . . . . 38. *R. conglomeratus.*

Leaves large, somewhat crisped or undulate, often narrowed at the base, seldom truncate; valves large, much broader than the grains; only the lower whorls with leaves and occasionally remote.

Leaves rather narrow, broadest at the middle, mostly much undulate, gradually narrowed to the base; petiole somewhat canaliculate on the upper side; valves (3.5–) 5–6 mm. long (shape of the leaves, the valves, and the number of the grains most variable) . . . . 37. *R. crispus.*

Leaves broader, often broadest below the middle, suddenly narrowed toward the base, truncate or slightly cordate, less undulate; petiole flat on the upper side; valves larger; grains smaller in proportion to the valves (rare)........36. *R. Patientia.*

Valves denticulate (compare also 49. *R. bucephalophorus*).

Plants perennial; basal leaves at most 2.5 times longer than broad, cordate at the base.

Leaves small; pedicels long, slender, nearly twice as long as the fruit, articulate at the middle. 42. *R. pulcher.*

Leaves large; pedicels long, slender, nearly twice as long as the fruit, articulate toward the base.
41. *R. obtusifolius* (mostly subsp. *agrestis*).

Plants mostly annual (but sometimes tall and robust); basal leaves 3–6 times longer than broad.

Pedicels thickish; valves shortly dentate; leaves obcordate-lanceolate, mostly widest above the middle, nearly 3 times longer than broad..44. *R. violascens.*

Pedicels long, slender; valves mostly long-dentate; leaves linear-lanceolate, mostly many times longer than broad.

Valves 3–3.5 mm. long, broad, triangular, relatively short-dentate; grain much narrower than the valve; leaves broad...........45. *R. flexicaulis.*

Valves at most 2 mm. long, narrow, triangular or elliptic, little broader than the grain, the teeth generally long, fine, often nearly hair-like (compare also 48. *R. maritimus*).

Valves triangular; grain fusiform, narrowed (length of the teeth very variable)....46. *R. fueginus.*

Valves ovate; grain thickish, rounded.
47. *R. persicarioides.*

1. Rumex Acetosella L.

A low, slender perennial with linear or lanceolate, hastate leaves; valves entire, not enlarged in fruit, not larger than the nutlet, grain-

SYNONYMY: L. Sp. Pl. 338. 1753; Michx. 216. 1803; Pursh 249. 1816; Campdera 122. 1819; Hook. 129. 1840; Meisn. apud DC. 63. 1856; Watson 10. 1880; Macoun 418. 1883; Trelease 46. 1892; Britt.

& Brown 547. 1896; Small 369. 1903; Piper 225. 1906; Gray 357. 1908; Woot. & Standl. 191. 1915; Rydb. R. 230. 1922; Jepson 293. 1923; Tidestrom 160. 1925; Rydb. P. 279. 1932; Rech. f. Vorarb. 3: 47. 1933.

A weed of European and Asiatic origin, naturalized nearly throughout the world. The subsp. *angiocarpus* Murb., Beitr. Fl. Südbosn. 46. 1891, is remarkable in the union of the valves and nutlets into a single body. American specimens cited below as only *R. Acetosella* are mostly staminate or pistillate and in flower, consequently I was unable to decide whether they are the common *R. Acetosella* or subsp. *angiocarpus* Murb.

ALASKA: Opening near edge of lake, Fortman Hatchery, Revillagigedo Isl. (*Walker* 1031, NY, P, Ca; basal leaves only). Sitka and vicinity, abundant about town (*Wright* 1557, Ca). Sitka (*Shaw*, P).

BRITISH COLUMBIA: New Westminster (?, Ca). Victoria (*Anderson*, P).

ONTARIO: Battersea, Kingston (*Fowler*, Ca).

QUEBEC: Côte-Nord du golfe St. Laurent, Natashquan, dunes (*Marie-Victorin & Rolland-Germain* 28554, St; *angiocarpus*). Cushing (*Adrien* 1288, St). Mont Oxford, sur un rocher dénudé (*Rousseau* 25263, St).

MAINE: Birch Island, Attean Pond, Jackman, Somerset Co. (*Schweinfurth* 574, P; *angiocarpus*).

MASSACHUSETTS: Amherst (*Brooks*, Ca). Hanson, field (*Morris*, Ca).

CONNECTICUT: Norwich (*Setchell*, Ca; *angiocarpus*). Berlin (*Brandegee*, Ca).

MINNESOTA: Zumbrota, Goodland (*Ballard*, Ca, P; subsp. *eu-Acetosella*). Itaska Park, headwaters of Mississippi River, along road, and in sand, Clearwater Co. (*J. B. Mayer*[?] 17, Ca).

WISCONSIN: Iowa Co., Blue Mounds (*Clikeman*, Ca). Brodhead, Green Co. (*W. C. Meyer* 5666, P).

ILLINOIS: Morgan Park Ridge (*Dixon & Gage* 656, Ca). Muncie, roadsides (*Gleason*).

IOWA: Grinnell, Poweshiek Co. (*Suksdorf*, P).

INDIANA: Indianapolis, Gladstone Avenue (*Friesner* 8731, P).

MISSOURI: St. Louis, Forest Park (*Eggert*, Ca; *angiocarpus*). Oakwood, Ralls Co. (*Davis* 4449, Ca).

ARKANSAS: Without locality (*Rafinesque*, DC).

SOUTH DAKOTA: Black Hills, Whitewood, 1,350 meters (*Rydberg*, Ca). Creek bottom, Deadwood (*Carr* 2113, Ca; *angiocarpus*). Brookings (*Thornber*, Ca).

WASHINGTON: Chehalis, Hoquiam (*Lamb* 1018, Ca). Camano Isl., abundant everywhere (*Gardner*, Ca). Friday Harbor, San Juan Co. (*St. John & Redout*, 3635, P; *angiocarpus*). Buffalo Rock, Snake River Canyon, Asotin Co. (*St. John, etc.* 8253, P; *angiocarpus*). Pullman (*Piper*, P; *angiocarpus*). Wenaha Forest, Columbia Co. (*Darlington*, P). Tucanon Valley, Columbia Co. (*Darlington*, P; *angiocarpus*). Kalama (*Goodwin* 31, P). Clark's Spring, Spokane, Spokane Co. (*Kreager* 129, P; *Beattie & Chapman* 2035, P). Stuart Island, San Juan Co. (*Lawrence* 53, 382, P). Centralia, Lewis Co. (*Owen*, P). Mazama Ridge, Mt. Rainier, Lewis Co. (*Hungate* 2, P). Mt. Adams (*Flett* 1046, P). Eight-mile Creek, Methow River Valley, Okanogan Co. (*Hungate* 18, P). Palouse River, Colfax, Whitman Co. (*Parker* 388, P). Anatone, Asotin Co. (*Gussell*, P). Seaview, Pacific Co. (*Spiegelberg* 638, P). Mt. Erie, Hidalgo Isl., Island Co. (*Hardin*, P). Camp Lewis, Pierce Co. (*Davidson*, P).

OREGON: Umpqua Valley, Roseburg Quadrangle, Douglas Co. (*Cusick*, P; *angiocarpus*). Sauvies Isl. (*Howell*, P). Albina, Portland (*Suksdorf* 716, P; *multifidus*). Portland (*Millard*, P). Mt. Hood, Hood River Co. (*English, Jr.*, 238, P). Grand Ronde Valley, near Union, Union Co. (*Cusick* 3340a, P). North Bend, Coos Co. (*H. H. Smith* 3703, NY). Fossil Lake, between Lakeview and Bryants (*Furlong, Greeley, etc.*, Ca).

IDAHO: Moscow, Latah Co. (*Abrams* 614, Ca). Lewiston, Nez Perce Co., 450–600 meters (*Heller* 3016, Ca). About forest, Nez Perce Co., 1,050 meters (*H. E. Brown* 22, Ca). Boise, sunny inclines, 865 meters (*Clark* 49, Ca, St). Boise, Ada Co., 840 meters (*Macbride* 248, P, Ca). Bear Creek Ranger Station, Idaho Co. (*K. F. Baker*, P; *angiocarpus*).

NEVADA: Kings Canyon, Ormsby Co., 1,700–2,000 meters (*Baker* 1202, P, Ca; *angiocarpus*). Truckee Meadows, Washoe Co., 1,350 meters (*Kennedy* 3053, St; *angiocarpus*).

NEW MEXICO: Hunter's Lodge near junction of Willow and Gilita creeks, Mogollon Mts., 2,550 meters, base of south slope (*Goddard* 735, Ca).

ARIZONA: Rincon Mts., Manning Camp, 2,370 meters (*Blumer* 3380, Ca).

CALIFORNIA: Scott River Valley (*Gilbert*, Ca). Near Laytonville, Mendocino Co. (*Davy* 5266, Ca). Near Comptche, Mendocino Co.

(*Walker* 289, Ca; *angiocarpus*). Near Mendocino, from sea level to 1,500 meters (*Brown* 717, Ca). Mt. Lassen, near Morgan, Tehama Co., Mill Creek Canyon, 1,500 meters (*Babcock & Hall* 4384, Ca). Lakeport, Lake Co. (*Holman*, Ca). Siskiyou Co., vacant lot, Greco (*Butler* 515, Ca; *angiocarpus*). Near Sisson, Siskiyou Co. (*Brown*, Ca). Horse Prairie, south side of Humboldt Redwood Park (*L. Constance* 807, P). Humboldt Co., vicinity of Eureka, 0–150 meters (*Tracy* 2414, Ca). North Coast Range, near Camp Grant, Humboldt Co. (*Davy* 5484b, Ca). Tuolumne Co., in sand, mouth of Bear Creek, Stanislaus River, 190 meters (*Williamson* 293, Ca). Yosemite Valley (*Fritchey* 58, SL). Sierra Nevada, pine ridge, Fresno Co., 1,590 meters (*Hall & Chandler* 275, Ca). Santa Cruz (*Berg*, Ca). North of Sacramento (*Ramaley* 11193, Ca). Vicinity of Oakland (*Holder* 2528, Ca). Berkeley (*Davy*, Ca). North Berkeley (*Condit*, Ca; var. *multifidus* DC.). Alameda Co., Berkeley Hills (*Parks* 1870, Ca). Amador Co., vicinity of Ione, 60 150 meters (*Braunton* 1008, Ca). Placer Co. (*Carpenter*, Ca). Arroyo Grande (*Condit*, Ca). Keen Camp, San Jacinto Mts., 1,440 meters (*Johnston* 5432, Ca). Los Angeles (*pupils of L. A. High School*, Ca). San Francisco Peninsula, Lake Merced (*Jones*, Ca; *angiocarpus*). Gravelly portion of meadow, Bluff Lake, San Bernardino Mts., 2,220 meters (*Munz* 10436, Ca). Alamere Creek, Marin Co., 8 miles above Bolinas (*Randall*, Ca; *angiocarpus*). Aromas (*C. Meyer* 357, Ca; *angiocarpus*). Cascade Drive, Mill Valley (*Walker* 644, Ca; *angiocarpus*).

JAMAICA: Blue Mt. Peak (*Orcutt* 5534, Ca; *angiocarpus*, partly).

2. **Rumex graminifolius** L.

Perennis. Caulis singulus vel saepius plures, erecti, tenues, stricti vel subflexuosi, paucifoliati, internodiis mediis ± elongatis, tenuissime sulcato-striati, ca. 6–25 cm. alti. Ochreae majusculae hyalinae candidae vel argenteo-nitentes, magnae, ± patentes, fissae sed persistentes. Folia basalia angustissime linearia, lamina petiolo saepe vix latiore, 3–5 mm. lata interdum revoluta, 3–6 cm. longa, basi utrinque lobo angustissimo acuto angulo fere recto patente provisa vel lobis omnino deficientibus. Folia caulina pauca basalibus similia interdum non evoluta. Panicula parva saepe pauciflora laxiuscula. Pedicelli floriferi flore breviores, fructiferi fructum aequantes, paulo infra perigonium insensibiliter articulati. Perigonii foliola exteriora marginibus interiorum appressa. Perigonii folia interiora (valvae) nuce ad summum duplo longiora et latiora. Nux 1.2–1.5 mm. longa, 1 mm. lata, rufo-brunneo-nitens, in medio circiter latissima.

SYNONYMY: *R. graminifolius* Rud. in Georgi, Beschreib. Russ. Reich 3, pt. 4: 921. 1800, nomen; Lamb. Trans. Linn. Soc. 10: 264. 1811; Meisn. apud DC. 64. 1856; Murbeck, Bot. Not. 42. 1899. *R. angustissimus* Ledeb. Mém. Acad. St. Pétersb. 5: 531. 1815.

ILLUSTRATION: Trans. Linn. Soc. 10: *pl. 10*.

DISTRIBUTION: Arctic Europe, Siberia, and America.

Only one American specimen examined: Alaska, Port Clarence, 65° 5′ N., 166° W. (*Kjellman*, St).

As the American specimen is very poor and not fruiting, I completed my description from Murbeck's, loc. cit., and from a Siberian specimen: Prov. Tobolsk, Obskaja Gub. Mys Kamenyi, 68° 30′ (*Saposchnikov & Nikitina*, MW). *R. graminifolius* is similar to certain forms of *R. Acetosella* (f. *integrifolius* Wallr. Sched. Crit. 1822; 186), especially as they occur in arctic regions, e. g., in Greenland (Hb. Stockholm). From these forms *R. graminifolius* is distinguishable by the valves, which are nearly twice as long as the nutlets.

3. **Rumex Acetosa** L.

Perennial; stems simple below the panicle; lower leaves ovate or oblong-ovate, 2–4 times longer than broad, deeply cordate at the base, with acute, hastiform or nearly sagittate auricles, somewhat obtuse at the apex; panicle usually small and rather compact, leafless; pedicels about as long as the fruiting perianth, jointed at the middle; outer perianth segments reflexed; valves orbicular, 3.5–5 mm. in diameter, with a small grain near the base.

SYNONYMY: L. Sp. Pl. 337. 1753; Hook. 129. 1840; Meisn. apud DC. 65. 1856; Macoun 417. 1883; Trelease 78. 1892; Britt. & Brown 548. 1896; Gray 357. 1908; Rydb. R. 231. 1922; Rydb. P. 279. 1932.

Widely spread over Europe and Asia and (according to Trelease, op. cit. 79) indigenous in America from "Labrador to Lake Superior, Alaska, and Oregon," and "introduced from the Old World at a few points in the Northern States, probably as a waif from gardens in which it is sometimes cultivated for its acid foliage." I saw specimens only from the following localities:

NEWFOUNDLAND: Torbay (*Howe* 1362, Ch).

ALBERTA: Milk River Bridge, in rich meadows (*Macoun* 12908, O). Headwaters of Saskatchewan and Athabasca rivers, Brogeon opposite Cotawet Pass (*S. Brown* 1046, O).

BRITISH COLUMBIA: Lake Louise (*Anderson*, P). Oak Bay (*Anderson*, P).

ALASKA: Little Diomede Isl., Behring Strait (*Weyer, Stall-McCracken Exped.*, NY).

OREGON: (*E. Hall* 442, SL). Silverton, Marion Co. (*Howell*, P).

4. **Rumex thyrsiflorus** Fingerhut

Nearly related to *R. Acetosa*, but differing from that species by the often taller stem, 50–120 cm. high, the leaves 4–12 times as long as broad, the panicle with many short branches and very dense; valves smaller, 2.5–3.3 mm. long. Flowering (in Europe where it is found sometimes in the same places as *R. Acetosa*) usually two weeks later than the latter. Originally from Europe and Asia; only one American specimen seen.

SYNONYMY: Linnaea 4: 380. 1829. *R. Acetosa* L. var. *auriculatus* Wallr. Sched. Crit. 182. 1822.

HAITI: Massif de la Selle, Marigot, Jardins Bois-Pin, near Source-Cresson, roadside, 2,100 meters (*Ekman* 10053, Wa).

To be expected on the American continent.

5. **Rumex paucifolius** Nutt. apud Wats. Figure 1

Radix perennis crassa atra fusiformis, saepe collo residuis caulium et petiolorum dilaceratis ± comosa, valde elongata, multiceps, caules floriferos et rosulas foliorum complures interdum permultos proferens. Caules floriferi stricte erecti (12–) 30 (–60) cm. alti, validi crassiusculi interdum subfistulosi, pallide virides, tenuiter canaliculato-sulcati, internodiis infra inflorescentiam paucis subelongatis. Ochreae albidae vel candidae hyalinae amplae fere infundibuliformes diu persistentes. Folia omnia plana, glabra et laevia, consistentia in vivo ut videtur subcarnosa, in sicco crassiuscule membranacea, colore pallide viridia, nunquam hastata vel auriculata. Folia basalia late lanceolata vel ovato-lanceolata, (3–) 6 (–9) cm. longa, (0.6–) 1.5 (–3) cm. lata, basi apiceque subaequaliter angustata, in medio—rarius basin versus—latissima. Nervus medianus crassus, nervi secundarii tenues, angulo ca. 30°–50° a mediano abeuntes. Petioli foliorum basalium crassiusculi, in vivo certe carnosi, laminae longitudinem subaequantes. Folia caulina pauca sursum valde decrescentia, anguste lanceolata, breviter petiolata, acutiuscula vel obtusiuscula. Inflorescentia rufescens, ± anguste paniculata, saepe contracta rarius laxa, subaphylla, interdum ramis inferioribus elongatis crebre subdivaricato-ramosis subcorymbosa, rami flexuosi erecto-patentes, infimi saepe fasciculati et ramosi, superiores singuli et simplices, infimi saepe elongati.

Florum glomeruli aphylli 3–12-flori saepius approximati vel contigui, rarius ± remoti. Pedicelli tenuiter filiformes breves, ± 2 mm. longi, infra medium insensibiliter articulati, perigonio fructifero plerumque breviores. Flores masculi ca. 1.5 mm. longi virescentes vel purpurascentes, antherae aureae, ca. 1.2 mm. longae. Flores feminei purpurascentes, stigmata flava penicillata. Perigonii foliola exteriora anguste lanceolata, ca. 0.8 mm. longa, basibus interiorum appressa. Perigonii folia interiora (valvae) in statu fructifero 2.9–3.8 mm. longa et lata, colore pallide carneo-bruneo, consistentia tenuiter membranacea, margine integra, basi ± anguste et profunde emarginata, apice rotundata, facie tenuissime elevate reticulato-nervosa, nervus medianus ceteris subvalidior plerumque non callifer. Nux matura brunea nitida, 1.2–1.8 mm. longa, 0.8–1 mm. lata, infra medium latissima.

SYNONYMY: *R. paucifolius* Nutt. apud Wats. Bot. King 314. 1871; Watson 10. 1880; Coulter 318. 1895; Macoun 417. 1883; Piper 225. 1906; Rydb. R. 231. 1922; Jepson 293. 1923; Tidestrom 160. 1925. *R. Engelmannii* Meisn. *β Geyeri* Meisn. apud DC. 64. 1856. *R. Geyeri* Trelease 78. 1892.

ILLUSTRATION: Trelease 1892, *pl. 15* (*R. Geyeri*).

DISTRIBUTION: Rocky Mountains from Canada to California.

ALBERTA: Vicinity of Banff, valley below Mt. Aylmer, 2,200 meters (*McCalla* 2397, Wa). Wet, grassy places, eastern summit of North Kootanie Pass, Rocky Mts. (*Dawson* 23703, O). Headwaters of the Saskatchewan and Athabasca rivers, upper Malique(?) Valley (*S. Brown* 1329, O; 1528, NY).

MONTANA: Flathead Divide, Gallatin Co. (*Jones*, Ca). Spanish Creek (*Vogel*, Wa). Yellowstone Park, Bridger Mts., 2,100 meters (*Rydberg & Bessey* 5346, Wa). Spanish Basin, Madison Range, 1,800 meters (*Flodman* 402, Wa). Gallatin Co., Spanish Basin, 1,950 meters (*Rydberg & Bessey* 5348, Wa). Midvale (*Umbach* 358, Wa). Northeast of Bozeman, Gallatin Co. (*Chestnut & Jones* 195, NY). Bozeman (*Blankinship* 455, Ch). Elkhorn Mt., 2,400 meters (*Brandegee*, Ca). Missoula, 960 meters (*Kirkwood* 1761, La, Ch). Rockwall Basin, Wilsall, Park Co. (*Suksdorf* 435, P, MW).

WYOMING: Teton Pass (*Merrill* 355, Wa). Low ground, Seckie(?) (*Merrill & Wilcox* 543, Wa). Dry soil, Teton Pass (*Merrill & Wilcox* 984, Wa). High, dry places, Wind River Mts. (*Forwood*, Wa). Parks, Big Horn Mts., Sheridan Co. (*Forwood*, Wa). Sheridan Co., Rapid Creek Park, 2,250 meters (*Pammel & Stanton*, SL). Subalpine meadow, Wyoming Range, 15 miles west of Merna, Sublette Co.

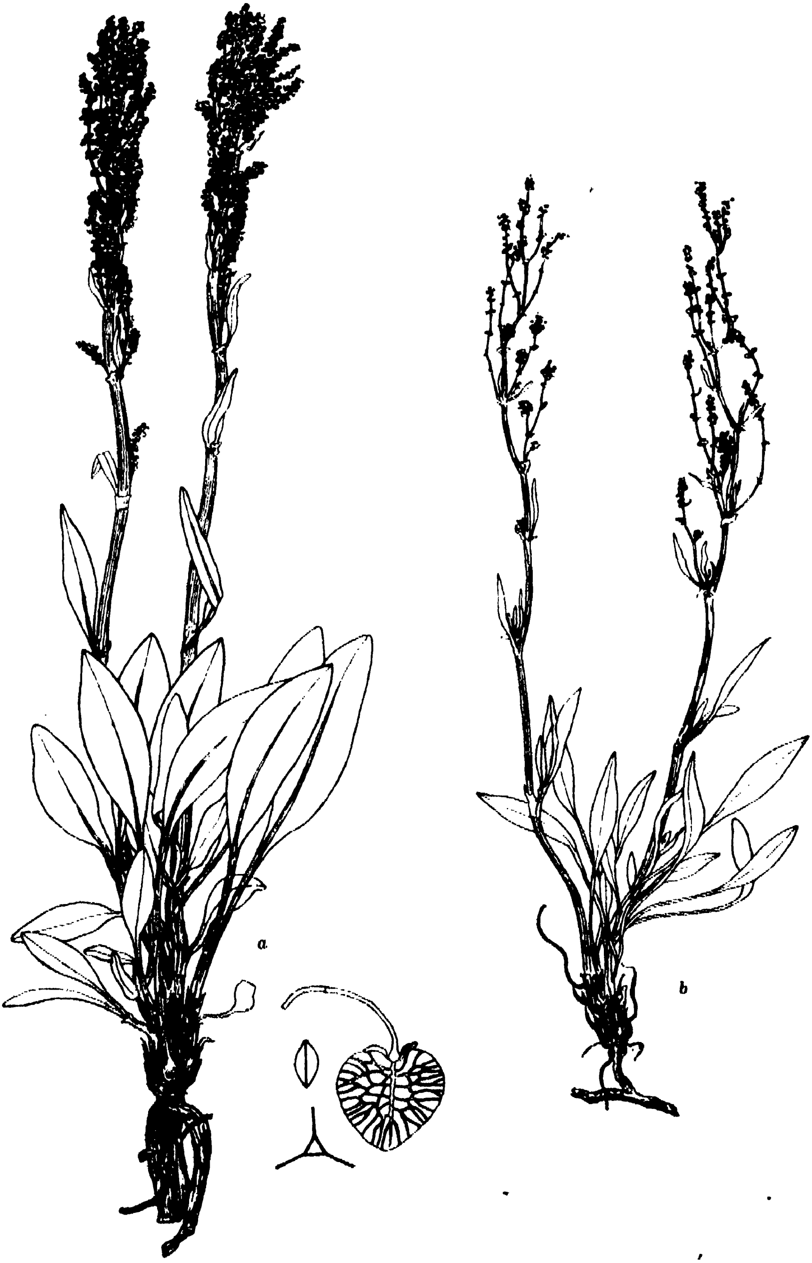


FIG. 1. *Rumex paucifolius* Nutt.

(*Payson* 2769, Ch, Ca). Above Petrified Tree, 1,950 meters, Camp Roosevelt (*Conard* 1121, MW). Yellowstone Park, near Mammoth Hot Springs (*Burglehaus*, St, Wa). Glen Creek, wet meadows, Yellowstone Park (*A. Nelson* 5582, La, Wa, NY). Electric Peak, 2,550 meters (*E. C. S.* 135, Wa). Yellowstone Park (*Knowlton*, Wa; *Mearns* 1405, 1044, Wa). Minor Lake Plateau, 2,670 meters, Yellowstone Park (*Tweedy*). Big Horn Mts., headwaters of Clear Creek and Crazy Woman River (*Tweedy* 3271, La). Ten Sleep Lakes, Big Horn Co. (*Goodding* 458, La). Lepee Creek (*Willits* 281, La). Jenny Lake (*Eikenberry* 39, Ch). Moran, Jackson Lake, Teton Mts. (*Yuncker* 5354, Ch).

COLORADO: Steamboat Springs, Routt Co. (*Eastwood*, Ca; *Osterhout* 2779, Wa, La). Subalpine semi-meadows, Rabbit Ear, Larimer Co. (*Goodding* 1546, NY, Ca, Be).

WASHINGTON: Without locality (*Canby* 1068, Ca; *Vasey* 121, Wa; 291, P). Falcon Valley, loose, volcanic soil (*Suksdorf*, Ca). Wenatchee Mts., Kittitas Co., in small, grassy plots near streams at the summit, 1,800 meters (*Elmer* 448, P, Wa; *Cotton* 1129, P).

OREGON: Elk Mts., Wallowa Co., 1,500 meters (*Sheldon* 8461, Wa, SL). Steins Mts., opposite Andrews, 1,950 meters (*Leiberg* 2559, NY, St, Wa, Ca). Big Meadows, Des Chutes River, Crook Co., 1,350 meters (*Leiberg* 501, Wa, Ke). Wet meadow, Summit Prairie, southern Blue Mts. (*Cusick* 2651, Ca, Ke, MW). Klamath Agency (*Walpole* 226, Wa). Eppa Glade, Swan Lake Valley, Klamath Co. (*Applegate* 3571, Ch). Rock Creek Bridge, Klamath Falls, Pelican Bay Road (*Peck* 2500, P).

IDAHO: Corral, Camas Prairie, Blaine Co., meadows near river (*Macbride & Payson* 2916, Ca, NY). Moist stream flat, 1,650 meters, Twilight Gulch, Owyhee Co. (*Macbride* 981, P, Ca). About Forest, Nez Perce Co., 1,050 meters (*Heller* 3437, Wa, Ca, Le, Z). Wet meadows, Nez Perce, highlands, rare (*Geyer* 488, MW, Ke; 484, D; type number of *R. Engelmannii* var. *Geyeri* Meisn.). In meadows, House Creek, Owyhee Co. (*Macbride & Nelson* 1840, NY, St). Near reservoir, Modoc Creek, Fremont Co., Targhee Forest, 2,400 meters (*Eggleston & Bowers* 22028, Wa). Caribou Forest (*Favre* 138a, La). Near Sawtooth (*Evermann* 600, Wa). Sawtooth Mts., 2,400–2,700 meters (*Boone*, La). Craig Mts. (*Henderson* 2404, P).

NEVADA: Upper Corral Creek, Jarbidge, wet slopes, 2,100 meters (*Macbride & Nelson* 2052, St, Wa).

CALIFORNIA: Willow Creek, Devils Garden (*Austin* 428, Wa, Ca). Low, flat, wet soil, Big Valley, Lassen Co. (*Nutting*, Ca). Modoc

Co., White Horse Lake (*Baker & Nutting*, Ca). Kaweah River Basin (*Hopping* 58, Ca). Sierra Valley (*Lemmon*, NW). Sierra Nevada, Mt. Silliman, 3,200 meters (*Palmer* 2094, Wa). Sierra Nevada, basin of the Upper Kern River, Tulare Co., Volcano Creek, 2,250 meters (*Hall & Babcock* 5456, Ca). Sierra Nevada, Mt. Goddard, 3,060 meters (*Hall & Chandler* 661, Ca). Inyo Co., Rock Creek Lake Basin, 3,240 meters, top of escarpment near Heart Lake, in *Pinus albicaulis* woods (*Peirson*, Ca). Soda Springs, Tuolumne Valley (*Brewer* 1696, Ca, Wa, P). Yosemite Valley (*Lembert*, Ca). Mt. Hoffman, Yosemite (*Eastwood* 388, Wa). Black Canyon, White Mts., Mono Co. (*Coville & Funston* 1804, Wa, Ke). Mono Co., Bloody Canyon (*Chestnut & Drew*, Ca). Trail to Mt. Whitney, Tulare Co. (*Culbertson* 4371, Ca). "U. S. Pacific Slope" (*State Survey* 1696, Ca).—All Californian specimens except the northern Californian (*Austin* 428 and *Nutting* without number) belong to var. *gracilescens* Rech. f.

The subgeneric character of separated sexes is not always very evident in this species. I frequently have observed rather more polygamous than entirely pistillate individuals, not so rarely completely staminate.

R. paucifolius agrees in general habit with *R. Acetosa* L. but is easily distinguished by its ovate-lanceolate, entire, never hastate basal leaves. The plant has usually a very strong, tapering root. The panicle is usually contracted and very dense by reason of the often elongate and frequently branched lower branches.

The variability of *R. paucifolius* is limited. Trelease, loc. cit., remarks: "Sometimes with a very minute, rounded callosity." I have not observed such a form, which evidently is very rare. Only in the middle and southern parts of the Californian mountains occurs a form, or perhaps a geographical race, deserving separation:

Var. **gracilescens** Rech. f., nov. var.

Caules numerosi, humiles, 15–20 cm. alti, inflorescentia laxa, folia basalia anguste lanceolata.

The specimens belonging to this variety are indicated in the list of specimens examined.

The area of *R. paucifolius* is limited to the mountainous western districts. In the lower southern and southeastern United States it is replaced by *R. hastatulus* Baldwin apud Elliott. In large regions of the United States occur no indigenous species of the subgenus *Acetosa*.

Explanation of Figure 1.—Rumex paucifolius Nutt.: (*a*), Montana, Flathead Divide, *Jones;* one-half natural size; (*b*), var. *gracilescens* Rech. f., California, *Hall & Babcock* 5456; one-half natural size; valves about 4 times natural size, Oregon, *Cusick* 2651.

6. **Rumex hastatulus** Baldw. apud Elliott. Figure 2

Radix gracilis tenuis perennis sed interdum iam primo anno caulem floriferem emittens. Caules plerumque singuli, (15–) 50 (–80) cm. alti, tenues graciles subflexuosi vel stricte erecti, pallide virides, tenuiter canaliculato-sulcati, internodiis infra inflorescentiam non numerosis saepe ± elongatis. Ochreae albidae vel pallide bruneae hyalinae ± evanescentes. Folia omnia glabra et laevia, plana, consistentia in sicco papyraceo-membranacea, colore pallide viridia, forma valde variabilia. Folia basalia 2–10 cm. longa, 0.3–1.8 cm. lata, obtusiuscula vel acutiuscula, anguste vel latiuscule lanceolata, integra oblongo-linearia vel basi appendicibus brevibus vel elongatis obtusis vel acutiusculis interdum valde divergentibus hastato-sagittata. Nervi secundarii foliorum basalium angulo ca. 30°–40° a mediano abeuntes. Petioli laminae longitudinem ± aequantes. Folia caulina quam basalia multo angustiora et proportione longiora, sursum sensim decrescentia, brevius petiolata, integra vel sagittata. Inflorescentia aphylla laxa diffusa, axis flexuosa, rami tenues flexuosi plerumque singuli nec fasciculati saepius simplices leviter arcuato-divergentes. Florum glomeruli aphylli ± pauciflori omnes remoti. Pedicelli tenuissime filiformes breves, 1.5–2.5 mm. longi, infra medium insensibiliter articulati, perigonio fructifero breviores vel eum ad summum aequantes. Antherae aureae ca. 1 mm. longae, perigonium florum masculorum antheris brevior. Perigonii foliola exteriora anguste lanceolata ca. 0.7 mm. longa basibus interiorum ± laxe accumbentia. Perigonii folia interiora (valvae) in statu fructifero ex emarginatione 2.5–3 mm. longa, 2.7–3.2 mm. lata, colore pallide stramineo-carneo, saepe ± purpureo-suffusa, consistentia tenuissime membranacea, margine subintegra, basi plerumque leviter et latiuscule emarginata, facie tenuissime elevate nervosa, maculis nervaturae centralibus ± isodiametricis, marginalibus valde transversaliter elongatis, nervus medianus ceteris validior sed non callifer. Nux matura fusca nitida, 0.9–1 mm. longa, 0.6–0.7 mm. lata, utrinque brevissime acuminata in medio circiter latissima.

SYNONYMY: *R. hastatulus* Muhl. Cat. ed. 2. 37. 1818, nomen; Baldwin apud Elliott, Sketch Bot. Car. & Ga. 416. 1821, descriptio; Trelease 77. 1892; Britt. & Brown 548. 1896; Small 369. 1903; Gray

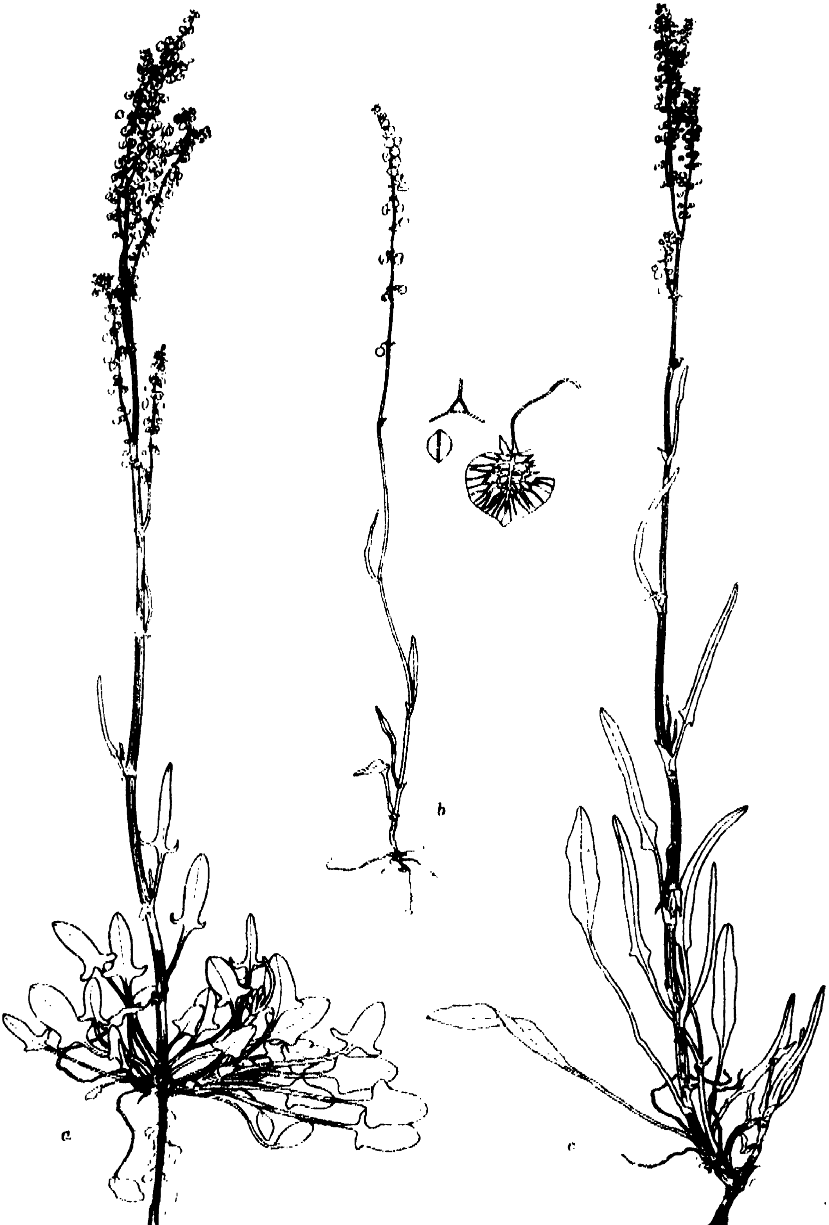


Fig. 2. *Rumex hastatulus* Baldw.

357. 1908; Rydb. P. 279. 1932. *R. Engelmannii* Meisn. apud DC. 64. 1856; *R. angustifolius* Engelm. ex Meisn. apud DC. 64. 1854, non Campd.

ILLUSTRATIONS: Trelease 1892, *pl. 14;* Britt. & Brown 548. 1896.

DISTRIBUTION: Eastern and southern United States.

NEW YORK: Long Island, River Head (*E. S. Miller*, Wa, Bu).

NORTH CAROLINA: (*McCarthy*, Wa).

FLORIDA: Old fields, cultivated ground, etc., near Jacksonville (*Curtiss* 2431, Mu, Bu; 4568, H, MW; 4193, Ca; *Hitchcock*, Ch). Vicinity of Eustis, Lake Co., high pine land (*Nash* 400, Ca, Be). Sandy fields near St. Mary's River (*Rugel* 36, Lu). Dry, sandy soil along roadside, Brooksville, Hernando Co. (*Moldenke* 1070, St). Dunes of Santa Rosa Island, in drifting sand (*C. Mohr* 2432b, UW).

ILLINOIS: Sandige Plätze in der Prairie d. American Bottom, gegenüber St. Louis (*Geyer* 538, MW). East Alton, Madison Co. (*McDonald*, P).

ARKANSAS: Fourche Mt., Little Rock (*Wheeler* 58, Ch).

MISSOURI: St. Louis (*Eggert*, Ca, Ko; *Engelmann*, St, Mu, UW, type of *R. angustifolius* Engelm. and *R. Engelmannii* Meisn.; *Geyer*, Be). Bernie (*B. F. Bush* 504, Be).

LOUISIANA: Jacksonville (*Drummond*, Lu).

OKLAHOMA: Sapulpa (*Bush* 1237, P, Be). Limestone Gap (*G. D. Butler* 10, UW).

TEXAS: Industry (*Lindheimer*, comm. *Engelmann*, Ke, Be). Colorado Co. (*J. F. Joor*, De). Giddings(?), Lee Co. (*Egelius*, Z). Dawson, sand (*Reverchon*, SL); Tarrant Co., in sandy pasture land (*Ruth* 464, NY). Between Brazoria and San Felipe (*Drummond* 349, Ke). Houston (*G. L. Fisher*, St). Fayette Co. (*Matthes* 165, MW). Sandy, open ground, Somerville, Burleson Co. (*Palmer* 11695, Ca). Without locality (*Reverchon* 1795, UW; *Drummond*, MW, Lu; *E. Meyer*).

"Nordamerika" (*Engelmann*, MW). "Sandy beach of Pleomie(?) River" (*Young*, NY).

Rumex hastatulus does not vary in form of the fruits but extremely in habit and form of the leaves; but there are no constant combinations of characters nor characters confined to certain regions, so I could not find any basis for distinguishing varieties. Sometimes *R. hastatulus* is able to flower even in the first year, and then gives, because of the slender roots and the absence of leaf remains of the preceding year, the impression of an annual plant. Such individuals have usually short, slender stems and narrow leaves and are often somewhat similar to *R. Acetosella* L. Robust individuals sometimes have axillary shoots from the lowest nodes. Specimens without the suggestion of hastate basal lobes on the leaves are very rare, but the length, breadth, and direction of the lobes are extremely variable. Staminate plants generally have narrower leaves with shorter basal lobes. The root, especially when compared with that of *R. paucifolius*, is very slender and relatively short, with tiny secondary rootlets. It produces always a single stem; only in luxuriant specimens or if the primary stem is damaged, the stem is branched from the base, giving the impression of a plant with several stems.

The usual interpretation of this species is opposed in one point to Elliott's original description, "Valvae graniferae," for neither Meisner nor Trelease mention a grain-bearing individual, nor have I been able to find any.

As to the name, the *Index Kewensis* cites wrongly *R. hastulatus* Baldwin apud Elliott instead of *R. hastatulus*. The South American *R. hastulatus* Smith in Rees, Cycl. 30: No. 29, 1819, not Baldwin as I cited by error in Vorarb. Rumex Monogr. 3: 4, is, according to *Index Kewensis*, a synonym of *Muhlenbeckia chilensis* Meisn. and has nothing to do with the North American *Rumex* here described.

Explanation of Figure 2.—*Rumex hastatulus* Baldw.: (*a*), Florida, *Curtiss* 4568; (*b*), Texas, *Drummond* 349; (*c*), North America, *Engelmann;* all one-half natural size. Valves from *Curtiss* 4568, Florida, 4 times natural size.

7. **Rumex venosus** Pursh. Figure 3, *a*

Perennis. Caulis gracilis humilis, 15–30 cm. altus, valde flexuosus, adscendens vel raro suberectus, tenuiter sulcato-striatus, flavescens vel virescens, ut tota planta glaber et levis, a basi plerumque longe et tenuiter flexuoso-ramosus, ramis foliatis saepe elongatis. Ochreae magnae candidae hyalinae margine dilatatae et patentes, diu persistentes. Folia caulina inferiora ambitu ovato- vel obovato-elliptica vel ovato-lanceolata, basi cuneata, apice acuta vel acuminata, margine angustissime papilloso- vel cartilagineo-marginata, latitudine 2–3-plo longiora, ± undata vel fere plana, consistentia in sicco tenuiter coriacea, nervis lateralibus angulo ± 45° a primario abeuntibus, interdum vix conspicuis. Petiolus foliorum inferiorum lamina subbrevior. Folia caulina superiora et folia ramealia inferioribus similia sed proportione minora apice magis acuminata brevius petiolata.

Rami inflorescentiae pauci tenues flexuosi brevissimi, infimus folio suffultus, paniculam parvam contractam formantes. Florum glomeruli pauciflori foliis suffulcrantibus omnino carentes, ± approximati, fructificationis tempore contigui. Perigoniorum fructiferorum pedicelli validiusculi deflexi in medio circiter tenuiter articulati, ad basin perigonii breviter infundibuliformi-dilatati, perigonio maturo breviores. Perigonii foliola exteriora lanceolata acuta, ca. 3 mm. longa, in emarginatione foliorum interiorum reflexa. Perigonii folia interiora (valvae) in statu fructifero ex emarginatione 14–18 mm. longa, 24–30 mm. lata, plana vel leviter undata, basi profunde et anguste emarginata, lobis basalibus sese attingentibus, apice late rotundata vel truncata margine integerrima, consistentia tenuiter membranacea, colore carneo-bruneo, facie tenuiter et creberrime reticulato-nervoso, macula quisque nervaturae primaria iterum crebre reticulato-nervosa. Valvae minime quidem calliferae. Nux matura brunea 5–7 mm. longa, 5–6 mm. lata, basi rotundata, apice acuta supra basin latissima.

SYNONYMY: *R. venosus* Pursh, Fl. Amer. Sept. 2: 733. 1814; Campdera 131. 1819; Hook. 130. 1840; Meisn. apud DC. 43. 1856; Watson 8. 1880; Macoun 415. 1883; Coulter 317. 1885; Trelease 79. 1892; Britt. & Brown 548. 1896; Piper 225. 1906; Gray 355. 1908; Rydb. R. 231. 1903; Jepson 291. 1923; Tidestrom 160. 1925; Rydb. P. 276. 1932.

ILLUSTRATIONS: Campdera 1819, *pl. 2;* Hook. 1840, *pl. 174;* Bot. Jahrb. 15: 270. 1892; Nat. Pflanzenfam. III. 1a: 17. 1892; Trelease 1892, *pl. 17;* Britt. & Brown 548. 1896.

DISTRIBUTION: Basin of the Saskatchewan River, Canada, and western United States from Washington and Nevada to the Missouri River Basin and Texas.

ALBERTA: Sandy banks, Seven Persons Coulee, Medicine Hat (*Macoun* 5882, O).

ASSINIBOIA: Sandy banks, Dunmore (*Macoun* 5883, Wa).

SASKATCHEWAN: Low ground, Swift Current (*Macoun* 23762, O). Clay bank at 12 Mile Creek near Wood Mountain (*Macoun* 12910, O). Sandhills near the Qu'Appelle River (*Macoun* 23763, O). Banks of streams, south of Wood Mountain (*Dawson* 78762, O).

SOUTH DAKOTA: Bad Lands (*Hatcher*, Ca). Black Hills, Custer, 1,650 meters(*Rydberg* 972, Be). Moist draw on prairie near Eastman, Washabaugh Co. (*Over* 2287, Wa).

NEBRASKA: Minden (*Hapeman*, P, Ca, MW). Long Pine (*Rutter*, Wa). Middle Loup River near Thedford, Thomas Co., on railroad

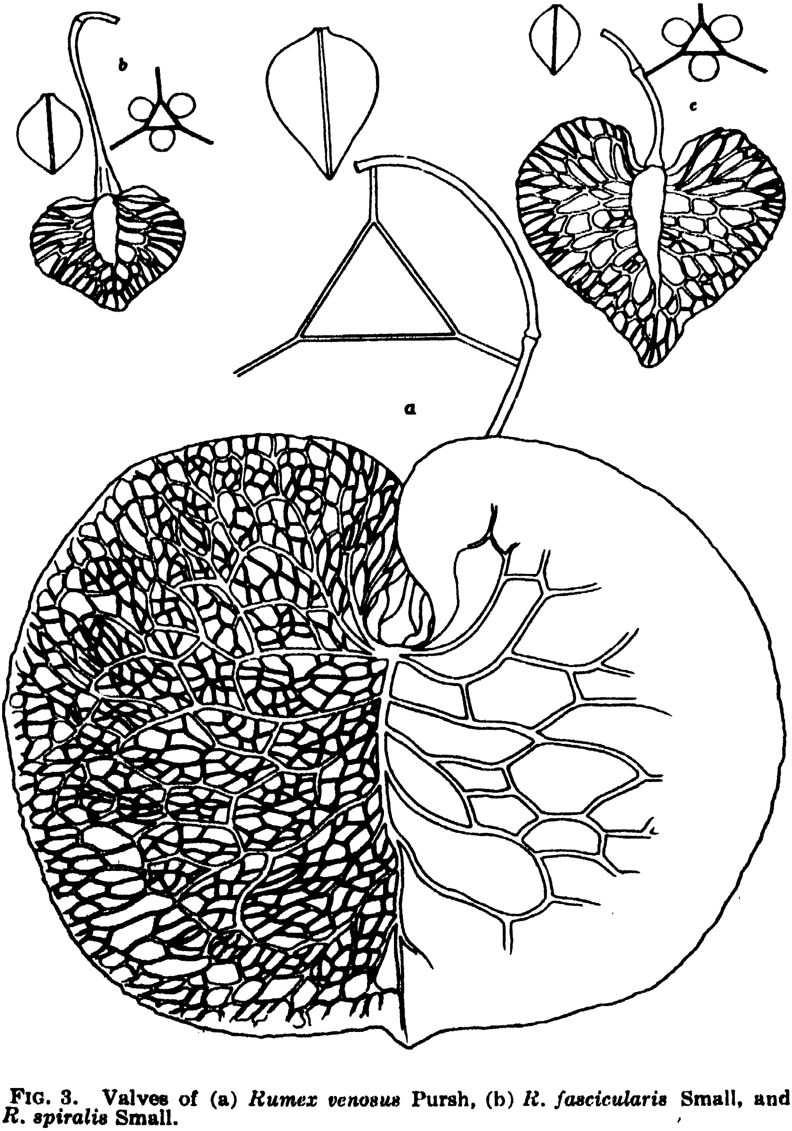


FIG. 3. Valves of (a) *Rumex venosus* Pursh, (b) *R. fascicularis* Small, and (c) *R. spiralis* Small.

bank (*Rydberg* 1288, Be). American Plains, 41° Lat. (*Hall & Harbour* 495, MW).

KANSAS: Manhattan (*Kellerman,* UW, Lu; *Gates,* Ch). Sandy soil, Riley Co. (*Norton* 450, UW). Medora (*Benke* 4273, Ch).

MONTANA: Greycliff, Sweet Grass Co. (*Eggleston* 7865, Ch, SL). Logan, 1,200 meters, Livingston, 1,500 meters (*Blankinship* 742, Be; *Swingle,* P). Upper Missouri, rocky and grassy slopes near the river (?, MW).

IDAHO: Lewiston, Nez Perce Co., 450–600 meters (*Heller* 3155, Ca, Z; *Parker* 304, P). Rocky hillside, valley of Clearwater River, Nez Perce Co. (*Sandberg, McDougal & Heller* 50, Wa, Be). Juniper Hills near St. Anthony, Fremont Co. (*Quayle* 26, La, NY). Deep sand, dry creek bed, 660 meters, Big Willow, Canyon Co. (*Macbride* 178, P, Ca).

UTAH: Salt Lake City, 1,290 meters (*Jones* 1729, Be, Bu). Ogden, along Southern Pacific Railroad embankments, common (*Hall* 10370, Ca). Garfield (*M. E. Jones,* Ca). Kanab (*Jones* 5284, La, Ca). Abundant in drift sand on pinyon hills, Fayette (*Tidestrom* 2096, Wa).

WYOMING: Sand dunes, Sand Creek, Albany Co. (*A. Nelson* 6981, Wa, Ke, Be). Laramie (*A. Nelson* 156, Ca). Laramie Hills (*A. Nelson* 1958, St). City Springs, Laramie (*A. Nelson* 4353, Ca). Depressions, loose soil, Laramie Hills (*Spalding* 154, St).

COLORADO: Colorado Springs (*Eastwood,* Ca). Denver (*Eastwood,* Ca, Lu; *Clokey* 3094, La). Between Colorado Springs and Denver (*Jones* 177, Wa, Be, Bu). Parkers, prairie near Denver, 1,800 meters (*Henry,* Be). Tobe Miller's Ranch (*Hb. State Agr. Coll. Colo.* 3844, Wa, Be, Lu, P). Canyon City, Fremont Co. (*Brandegee* 900, Ca). Plains, Cheyenne (*Vasey* 499, Ke, Be). Custer Co., chiefly from about 2,400 meters (*Cusack*). Fort Collins (*Baker,* Be). Plains of northern Colorado (*Greene,* MW). La Veta (*Rydberg & Vreeland* 6329, La).

NEW MEXICO: (*Fendler* 758, Ke).

TEXAS: (*Reverchon,* Wa).

WASHINGTON: Whitman Co., one mile from Wilma (*C. F. Lackey,* MW). Whitman Co., Wawawai (*Elmer,* Z). Truax (*St. John* 5905, P). Central Ferry (*St. John* 6037, P). Spokane Co., Hangman Creek, 460 meters (*Sandberg & Leiberg* 28, P, Ca, Wa, St, Ko, Le). Yakima Co., Satus Station, 150 meters (*Heidenreich* 91, P). Yakima Region, light soil, Washtucna(?), Adams Co. (*Cotton* 981, P, Wa). Yakima region, sandy soil near laterals, Sunnyside (*Cotton* 382, P, Be). Near

Wenatchee, Kittitas Co. (*Whited* 1224, Wa). Moses Lake, Douglas Co., 390 meters (*Sandberg & Leiberg* 374, P, Ca, St, Ko). Klickitat Co., sandy places, Columbia River (*Suksdorf* 896, Ca, Mu, Be). Sandbanks, Columbia River (*Howell*, P, Be, Bu, Mu). Barren, sandy grounds in the interior, Columbia River (?, Ke). Paradise Valley, Humboldt Co. (*Train*, P). Pasco (*Piper* 2983, P; *Heidenreich*, P). Rattlesnake Hills, Benton Co. (*Bennett*, P). Almota (*Piper* 1549, 2940, P). "The Junipers," near Fishook, Franklin Co. (*Cotton*, P). Above mouth of Grande River (*St. John & Brown* 3844, P). Attalia (*Beattie* 3923, P). Rocklyn, Lincoln Co. (*Mielke*, P). Wenatchee (*Whited*, P). Central Washington (*Vasey* 33, P).

OREGON: Dry, rocky bed of vernal stream near Malheur River, rare (*Cusick* 2552, P, Ca, Be, Z, MW). Sandy waste, 4 miles east of the Dalles, Wasco Co. (*Thompson* 4084, Wa). Columbia River, Lat. 46°–49°, Dalles (*Lyall*, Be). Damp, alkaline ground, southeast of Keno, Klamath Co. (*Peck* 2394, Ke).

NEVADA: Wadsworth (*Grunow*, MW). Esmeralda Co., Belleville, open sand (*Shockley* 223, Ca). North of University, Reno (*Thomas*, Ca).

CALIFORNIA: Sheridan (*Smith*, P).

This species is so different from all others that it must be considered as representing a special subsection of the section *Axillares*. The valves, 24–30 mm. broad when ripe, are the largest known in the whole genus. In this respect *R. venosus* may, within the subgenus *Lapathum*, be compared only with *R. macranthus* Boiss. of western Asia, and within the subgenus *Acetosa* with representatives of the section *Vesicarii* from the southern parts of the Mediterranean Basin. The first is very different from *R. venosus* in the sectional vegetative characters; the last-named group, moreover, in the subgeneric sexual characters.

Explanation of Figure 3, a.—Valves of *Rumex venosus* Pursh, 4 times natural size.

8. **Rumex verticillatus** L. Figure 4

Perennis. Caulis erectus 40–100 cm. altus, gracilescens, leviter anguloso-flexuosus, tenuiter sed profunde canaliculatus, saepe purpurascens, ex axillis foliorum vel e radicis collo ramos breves vel elongatos foliosos vel fasciculos foliorum proferens. Ochreae pallide bruneae hyalinae cylindricae ad nodos inferiores usque 5 cm. longae. Folia omnia in sicco tenuiter papyracea, plana, glabra et levia, sub lente tantum minutissime et sparse papilloso-punctata, nervis secun-

dariis leviter curvatis a primario angulo ca. 45°–60° abeuntibus. Folia infima lineari-lanceolata, basi cuneata, apice acuta, latitudine ca. 5–7-plo longiora; petiolus foliorum basalium tertiam circiter partem longitudinis laminae aequans. Folia caulina anguste lineari-lanceolata, latitudine 6–9-plo longiora, utrinque aequaliter fere angustata, plana vel subundata, brevius petiolata; petiolus latitudinem folii circiter aequans. Folia caulina superiora et folia ramealia inferioribus similia sed proportione minora angustiora brevius petiolata. Rami inflorescentiae ± breves tenues flexuosi singuli simplices ± arcuato-divergentes, infimi tantum ex axillis foliorum orientes, paniculam parvam apertam formantes. Florum glomeruli multiflori omnes ± remoti vel superiores approximati, omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli validi rigidi longissimi, prope basin incrassato-articulati ibique deflexi, basin perigonii versus sensim dilatati et sulcato-alati, perigonio maturo 3–5-plo longiores. Perigonii foliola exteriora anguste lineari-lanceolata acuta, ca. 2.5 mm. longa, marginibus interiorum arcte appressa. Perigonii folia interiora (valvae) in statu maturo 4–5 mm. longa, 2.5–4 mm. lata, pallide brunea, tenuiter coriacea, basi rotundato-dilatata, apice in linguam angustam acutam producta, margine integra, facie irregulariter scrobiculato-rugosa vel fere transversaliter calloso-plicata plicis irregulariter anastomosantibus, omnia callifera. Calli subaequales angusti valde prominentes, latitudine usque 4-plo longiores, lateraliter ad basin transverse rugosa, ceterum sub lente minutissime celluloso-punctati. Nux matura brunea ca. 3 mm. longa, ca. 1.8 mm. lata, basi brevius, apice paulo longius acuminata, vix infra medium latissima.

SYNONYMY: *R. verticillatus* L. Sp. Pl. 334. 1753; Michx. 217. 1803; Pursh 248. 1816; Campdera 98. 1819; Meisn. apud DC. 47. 1856; Macoun 416. 1883; Trelease 85. 1892; Britt. & Brown 549. 1896; Small 369. 1903; Gray 356. 1908; Rydb. P. 280. 1932.

ILLUSTRATIONS: Trelease 1892, *pl. 23;* Britt. & Brown 549. 1896.

DISTRIBUTION: Lower parts of southeastern Canada and the eastern and middle United States.

QUEBEC: L'Ile de Montréal, Saint-Laurent (*Adrien* 1073, St). Environs de Montréal, Longueil, rive du St. Laurent (*Rolland-Germain* 29205, St). St. Blaise, Saint-Jean, sur les bords marécageux du Richelieu (*Marie-Victorin* 28343, Br). Environs d'Ottawa (*Marie-Victorin* 10073, Wa). River shore swamp, Aylmer (*Harrington* 1908, O). Bell's Lake, Wakefield (*Macoun* 80838, O). Saint-Joseph (*Adrien* 1483, St).

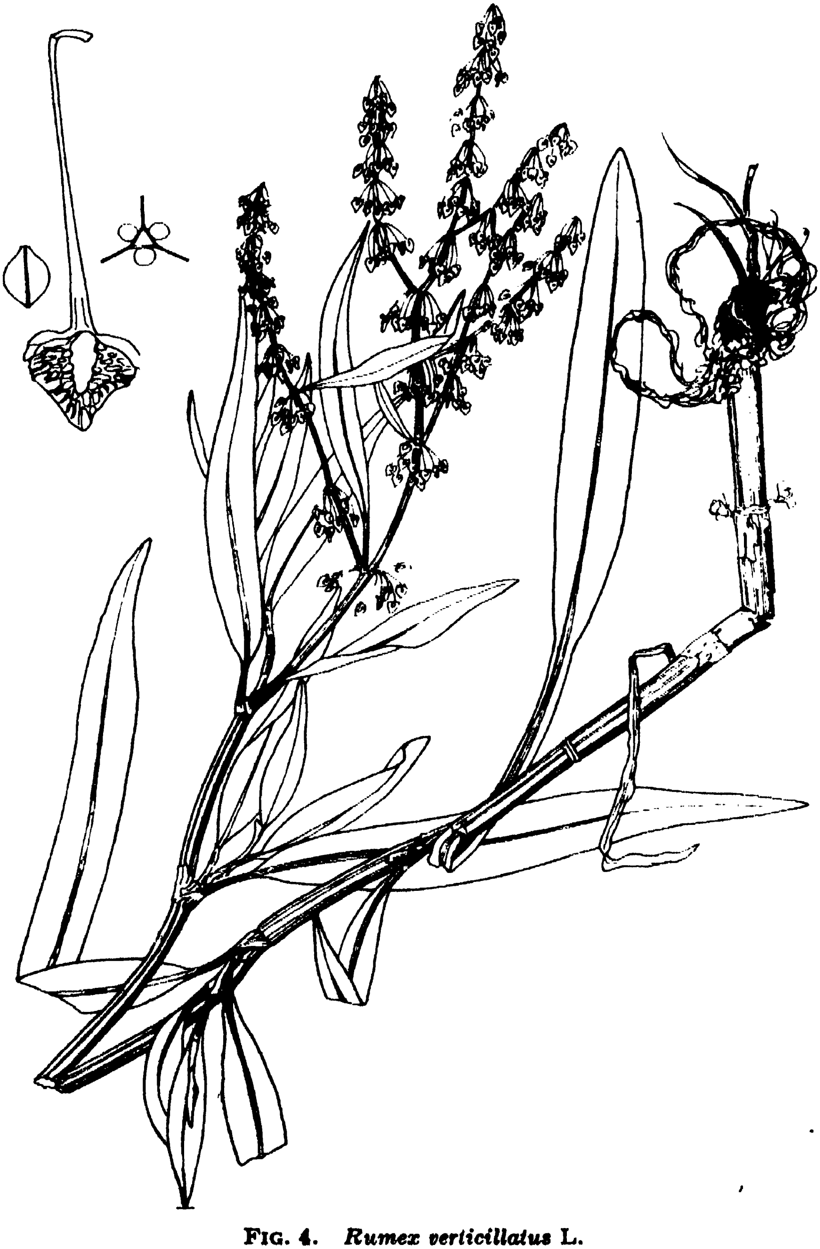


Fig. 4. *Rumex verticillatus* L.

ONTARIO: Cunnings Bridge, Ottawa, ditches (*Macoun* 5881, O). Billings Bridge near Ottawa (*Macoun* 80837, Be). In marsh at Malloch's Bay, Ottawa River, above Ottawa (*Macoun* 60810, O). Marsh above Brittania (*Macoun* 83599, O). Near Belleville, swamp and ditches (*Macoun* 23761, O). Niagara River, Dunnville (*Macoun* 54769, O). Swampy river shores, Brittania (*Harrington* 1908, O).

VERMONT: Banks of Big Otter Creek, swampy places (*Morong*, NY).

NEW YORK: Ithaca (*Rowlee*, Wa; *Malte*, Lu; *Muenschler & Bechtel*, P). Swampy ground along Grass River, Canton (*Phelps* 394, Wa). Marshy margin of outlet to Black Lake, Oswegatchie (*Phelps* 1402, Wa). Without locality (*Wright*, Bu).

PENNSYLVANIA: (*Bernhardi* in 1837, Bu; *Muhlenberg*, St, Mu).

MARYLAND: In swamp, Chesapeake Beach (*Tidestrom* 1116, Wa).

VIRGINIA: Ocean View, Norfolk Co. (*Kearney* 1216, Wa). Wet woods, along Plankatank River, 2 miles north of Glens Forks, Middlesex Co. (*Leonard & Killip* 32, Wa). Mucky edge of cypress swamp, Virginia Beach (*Sudworth*, Wa).

SOUTH CAROLINA: Shell Creek opposite Port Royal Sound (*Harris* 2124A, Wa). Moist ditch south of Charleston, Charleston Co. (*Moldenke* 1211, St). Porcher's Bluff, Christ Church Parish, Charleston Co. (*Mearns* 38, Wa).

FLORIDA: McIntosh (*Miller* 508, Wa). In fossis prope St. Marks (*Rugel*, NY, Lu). Swampy soil, Fort Myers, Lee Co. (*Moldenke* 953, St). Miry meadows along St. Augustine Branch, Tallahassee (*Harper*, Wa). Miami (*Hitchcock*, Ch).

OHIO: St. Marys, swamps (*A. Wetzstein*, Univ. Graz). Cleveland (*Krebs*, Be). Ohio (*Frank*, Z).

TENNESSEE: In paludosis ad French Broad River prope La Dandridge (*Rugel*, MW).

ALABAMA: Montgomery (*C. Mohr*, Wa). Mobile (*Baker*, NY).

ILLINOIS: Algonquin (*Vasey*, Bu). Swan Lake near Grafton, Calhoun Co. (*Metcalfe* 1114). Illinois (*Eggert* 294, Be, Bu, Z). Cahokia (?, Lu). Without locality (*Vasey*, MW, Bu).

INDIANA: Knox Co. (*Spillman* 161, P).

IOWA: Moore, in shallow water of ponds (*Conard*, MW).

MISSOURI: St. Louis, wet places (*Engelmann*, Be; *Eggert*, Ko; *Drummond* 143, Ke). Courtney, swamps (*Bush* 3979, Wa). Slough, Wayland, Clark Co. (*Metcalfe* 1095, Wa). Jerome (*Kellogg* 516, Wa). Mexico, Audrain Co. (*Palmer & Steyermark* 40792, MW).

ARKANSAS: Big Lakes, Hornersville (*Metcalfe* 640, Wa).

LOUISIANA: Gretna, opposite New Orleans, swampy woods (*Ball* 338, Wa).

TEXAS: San Felipe (*Drummond*, Lu). Galveston (*Lindheimer*, Be). Houston, Harris Co. (*Dixon* 623, Ch). Without locality (*Reverchon*, Be).

R. verticillatus forms, together with *R. floridanus* Meisn. and *R. fascicularis* Small, a very natural group, the subsection *Verticillati*. *R. verticillatus* and *R. floridanus* are not always easily distinguishable from each other. As to the differential characters, see under the latter species. Perhaps it would be better to reduce *R. floridanus* and *R. fascicularis* to subspecies of *R. verticillatus*.

Explanation of Figure 4.—*Rumex verticillatus* L., about one-half natural size, from *Macoun* 83599, Ontario. Valves 4 times natural size, from *Macoun* 83598.

9. **Rumex floridanus** Meisn. Figure 5

Perennis. Caulis 40–80 cm. altus, firmus subfistulosus, profunde sulcato-canaliculatus, plerumque atropurpureus, iam infra medium ramos foliosos breves serius elongatos floriferos proferens. Ochreae magnae pallidae hyalinae cito evanescentes. Folia omnia in sicco crassiuscule papyracea interdum subcoriacea rigidula, plana, glabra et laevia, sub lente tantum minutissime et sparse punctulata, nervis secundariis leviter curvatis, angulo ± 60° a primario abeuntibus. Folia caulina ad 20 cm. longa, 5 cm. lata, late lanceolata, latitudine 3 5 (–6) -plo longiora, utrinque subaequaliter angustata, plana. Petiolus latitudinem laminae subaequans. Folia caulina superiora et ramealia sensim minora, summa imprimis angustiora. Rami inflorescentiae breves raro infimi elongati tenues sed tenaces, singuli simplices, infimi tantum folio suffulti, paniculam parvam ± contractam formantes. Florum glomeruli multiflori in statu fructifero omnes contigui, infimi interdum paulum remoti, omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli validi rigidiusculi prope basin incrassato-articulati, ibique deflexi, basin perigonii versus sensim dilatati et sulcato-alati, perigonio maturo (1.5–) 2 (–3) -plo longiores. Perigonii foliola exteriora anguste lineari-lanceolata basibus interiorum appressa, ca. 2.5 mm. longa. Perigonii folia interiora (valvae) in statu maturo 4–5.5 mm. longa, 4.5–6 mm. lata, longitudine semper evidenter latiora, basi truncata, apice breviter acuminata margine integra facie prominenter reticulato-nervosa, maculis nervaturae marginalibus valde elongatis, color valvarum fructiferarum atro- vel fusco-bruneus, consistentia rigide coriacea. Valvae omnes calliferae; calli subaequales angusti valde prominentes, 3–4 mm. longi, ca. 1 mm. crassi, plerumque rugulosi. Nux matura atro-brunea, 2.5–3.5 mm. longa, 2–3 mm. lata in vel paulum infra medium latissima, basi breviter, apice sublongius acuminata.

SYNONYMY: *R. floridanus* Meisn. apud DC. 46. 1856 (non *R. floridanus* Trelease 86. 1892).

DISTRIBUTION: Eastern and southeastern United States.

NEW JERSEY: Cape May Co., near Wildwood (*Pollard*, Wa, St). Paterson, above the falls of Passaic River, Passaic Co. (*Rabenau*, Lu).

DELAWARE: Wet woods near Milton, Sussex Co. (*Britton* 46, NY).

GEORGIA: Altamaha Grit, Darien, McIntosh Co. (*H. H. Smith* 2158, MW).

FLORIDA: Alva, ditch, Lee Co. (*Hitchcock* 301 or 307, NY, Wa). Fort Myers (*Hitchcock*, Ch). Pondillo, moist thicket, vicinity of Fort Myers, Lee Co. (*Standley* 52599, Wa; no fruits). Titusville, Brevard Co. (*Nash* 2286, Wa, Ke, Be, Le, UW). Near Jacksonville (*Curtiss* 4850, Wa). In fossis et ad fluvium prope St. Marks (*Rugel*, MW). Without locality (*Vasey*, Wa).

ALABAMA: Borders of ditches, marshes, ponds, muddy banks, etc., Mobile (*Mohr*, Wa, Be). Cedarpoint (*Mohr*, Ch).

LOUISIANA: New Orleans (*Drummond* 280, Lu, Ke; *Hitzer*[?], UW). Vicinity of Lake Charles (*Allison* 133, Wa, SL). Along a ditch of saltish water, Côtes Blanches, St. Mary Co. (*Langlois*, Wa), Mississippi Delta and adjacent islands (*Lloyd & Tracy* 131, Wa. NY, MW).

Rumex floridanus is very similar to *R. verticillatus* L. It differs from the latter by the following characters: shorter, broader leaves of somewhat leathery consistency, more robust stem, denser fruiting panicle, shorter fruiting pedicels (being in pressed plants not so conspicuous as in *R. verticillatus*), valves broader than long, and by the darker color of the whole plant, especially of the fruiting perigonia. The fact that these characters occur in most cases combined, and limited to the southeastern United States, seems to confirm the specific distinction of the two types, even if in some cases one or another of the characters is not so decided.

I have not seen Meisner's type specimen, but there can not be any doubt about the identity of his plant with the one here described. The following remarks from Meisner's description confirm it sufficiently: "Racemis continuis . . . demum densis . . . pedicellis subduplo

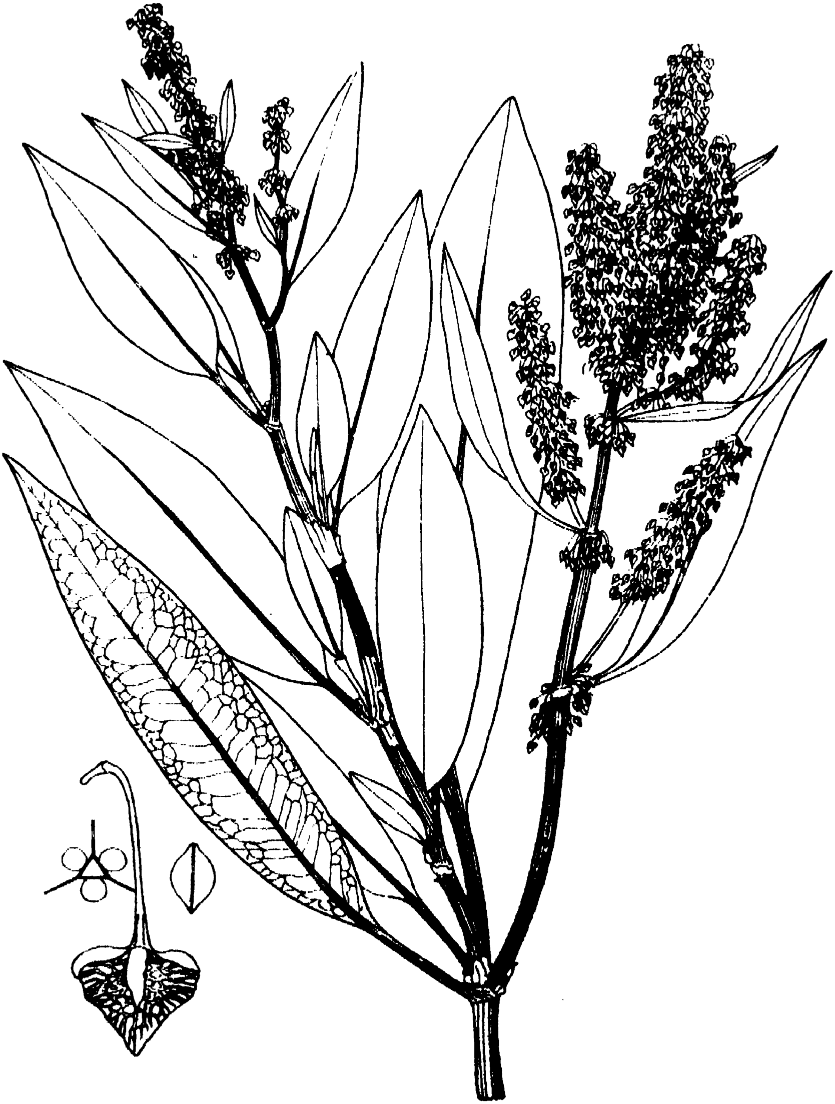


Fig. 5. *Rumex floridanus* Meisn.

longioribus. . . valvis demum latioribus quam longis. . . differt a *R. verticillato* pedicellis brevioribus, valvis basi truncatis distinctius reticulatis."

Trelease, op. cit. 86. *pl. 24*, describes and figures under the name of *R. floridanus* a quite different plant (*R. Berlandieri* Meisn.), as Small, Bull. Torrey Club 23: 405, has already pointed out.

Explanation of Figure 5.—*Rumex floridanus* Meisn., one-half natural size; *Curtiss* 4850, Florida. Valves 4 times natural size, from *Nash* 2286.

10. **Rumex fascicularis** Small. Figure 3, *b*

Perennis. Radices fibrae 3–5 fusiformi-incrassatae 5–10 cm. longae. Caulis 50–60 cm. longus decumbens vel adscendens gracilis subfistulosus flaccidus ± flexuosus profunde sulcato-striatus; internodia media elongata ad 12 cm. longa, inferiora et superiora brevia. Caulis e nodis mediis ramos abbreviatos foliosos verosimiliter serius florentes emittens. Ochreae hyalinae mox evanescentes. Folia caulina inferiora ignota. Folia caulina media ad summum 20 cm. longa, 9 cm. lata in vivo crassa (ex auctore) in sicco tenuiter papyraceo-membranacea, e basi leviter cordata ovata vel oblongo-ovata, apice acuta, latitudine ± duplo longiora, in quarta vel tertia parte inferiore latissima. Foliorum lamina plana glabra levis, sub lente in sicco minutissime flavido-punctulata. Nervi secundarii leviter arcuati a primario angulo ca. 70°–80° abeuntes. Petiolus dimidiam latitudinem laminae aequans vel paulo superans. Folia ramealia caulinis similia sed paulo minora. Panicula laxa aperta; axis saepe anguloso-flexuosa; rami fructiferi singuli plerumque simplices, tenues, ab axi principali angulo ± 45° abeuntes, sulcato-striati, flexuosi, omnino aphylli. Perigoniorum fructiferorum pedicelli prope basin tenuiter articulati, longissimi, perigonio 3–4-plo longiores ab articulatione stricte deflexi, basin perigonii versus sensim paulo incrassati et subalato-sulcati. Perigonii foliola exteriora lineari-lanceolata, dimidiam latitudinem interiorum paulum superantia, apice incurva, ca. 3 mm. longa, marginibus interiorum appressa. Perigonii folia interiora (valvae) in statu fructifero late rotundato-triangularia vel subcordata, partim longitudine latiora, 4–5 mm. longa et lata, apice acuta vel rotundato-acuminata vel interdum paulum liguliformi-producta, margine integra vel obsolete subcrenata. Facies valvarum tenuiter reticulato-venosa. Maculae nervaturae marginales valde elongatae. Valvae ± tenuiter membranaceae, omnes calliferae; calli subaequales ovato-fusiformes valde prominentes, latitudine 3-plo fere longiores, minute impresse punctulati, insuper transverse rugosi.

Nux brunea, 2–2.5 mm. longa et lata, marginata, apice breviter acuminata, paulo infra medium latissima, longitudine interdum paulo latior.

SYNONYMY: *R. fascicularis* Small, Bull. Torrey Club 22: 367. 1895; Small 369. 1903.

ILLUSTRATION: Bull. Torrey Club 22: *pl. 246.*

FLORIDA: Vicinity of Eustis, Lake Co., cypress swamps (*Nash* 898, Wa, NY; type).

R. fascicularis is nearly related to *R. verticillatus* L. and *R. floridanus* Meisn. It is similar to these species especially in the pedicels and fruiting perigonia, but differs from both remarkably by the much broader and shorter leaves, these being at most twice as long as wide and slightly cordate at the base, with long petioles, and lateral nerves that form a less acute angle with the midrib, and by the lower and more slender stem. I can not decide whether fusiform-incrassate root fibers form a differential character against *R. verticillatus* and *R. floridanus*, because I had no opportunity to study the subterranean parts of the latter species.

Besides the type number, I saw only one specimen possibly belonging to *R. fascicularis:* Ohio, Middletown (*Riddell,* Wa). In habit it is similar to *R. fascicularis*, but differs from the type by its somewhat narrower leaves, broadly rounded at the base, and by its shorter petioles. The specimen is in these respects an intermediate between *R. fascicularis* and *R. floridanus.*

Explanation of Figure 3, b.—Valves of *Rumex fascicularis* Small, 4 times natural size, from *Nash* 898.

11. **Rumex spiralis** Small. Figure 5, *c*

Perennis ("rootstock woody, creeping 1–2 dm. long, roots fibrous" ex auctore). Caulis ascendens vel erectus purpurascens tenuis gracilis ± flexuosus, tenuiter sed profunde canaliculato-sulcatus, a basi fere ex axillis foliorum ramos foliosos serius elongatos emittens, 60–90 cm. altus. Ochreae magnae albidae hyalinae cylindricae diu persistentes. Folia in sicco consistentia tenuiter papyracea, colore pallide viridi, basin versus interdum leviter undulato-crispata, ceterum fere plana, utrinque glabra et levia, sub lente tantum minutissime punctulata. Nervi secundarii foliorum tenues, vix arcuati angulo 50°–60° a primario abeuntes. Folia caulina inferiora ovato- vel oblongo-lanceolata, basi rotundata vel truncata, apicem versus sensim attenuata, 10–15 cm. longa, 3.5–5.5 cm. lata, latitudine 2.5–3.5-plo longiora, in tertia circiter parte inferiore latissima, petiolata.

Petioli latitudinem folii subaequantes. Folia caulina superiora multo angustiora, latitudine 4–6-plo longiora, basi cuneata, apice longius angustata, petiolus latitudine laminae ± longior. Rami inflorescentiae tenues flexuosi singuli simplices, angulo 40°–60° ab axi principali divergentes, omnino aphylli, breves, infimi interdum paulum elongati ad 12 cm. longi. Florum glomeruli multiflori, omnes fere approximati, in statu fructifero contigui, foliis suffulcrantibus omnino carentes. Perigoniorum fructiferorum pedicelli tenues, (2–) 3–5 mm. longi, in vel infra medium incrassato-articulati, ad basin perigonii nodoso-incrassati, perigonio fructifero semper multo breviores. Perigonii foliola exteriora anguste lanceolato-linearia, ca. 2.5 mm. longa. Perigonii folia interiora (valvae) in statu fructifero ex emarginatione 7–8 mm. longa, 8–12 mm. lata, longitudine semper latiora, basi profunde emarginata, apice acuminata, ambitu late cordata, margine integra, facie prominenter pulchre subregulariter reticulato-nervosa, consistentia coriaceo-membranacea, colore pallide rufo-brunea. Valvae omnes calliferae, callus valde prominens, anguste fusiformis, ca. 5 mm. longus, ca. 1–1.3 mm. crassus, in nervum medianum valvae sensim transiens, rugulosus. Nux matura atrofusca ad angulos anguste pallide marginata, 3 mm. longa, ± 2.2 mm. lata, basi fere rotundato-truncata, apice breviter acuminata, infra medium latissima.

SYNONYMY: *R. spiralis* Small, Bull. Torrey Club 22: 44. 1895; Small 370. 1903.

ILLUSTRATION: Bull. Torrey Club 22: *pl. 228.*

TEXAS: Kenedy, Karnes Co., 120 meters (*Heller* 1781, Ca, Wa, Ke; no fr., type). San Antonio, edge of lake (*Schultz* 151, Wa; the leaves narrow, 5 times as long as broad).

This species has the largest fruiting perigonia and the largest nutlets of the subsection *Salicifolii* and may be recognized easily by these characters. *R. spiralis* is, so far as known, strictly limited to Texas, and seems to be a rare plant.

Explanation of Figure 3, c.—Valves of *Rumex spiralis* Small, 4 times natural size, from *Heller* 1781, Texas.

12. **Rumex altissimus** Wood. Figure 6

Perennis. Caulis erectus ad 80 cm. altus validus subfistulosus flexuosus vel strictus, plerumque atropurpureus, profunde sulcato-canaliculatus, a medio vel infra ramos foliosos serius valde elongatos et floriferos emittens. Ochreae magnae albidae hyalinae evanescentes. Folia omnia in sicco colore pallide virescenti, consistentia rigide papyracea, plana, glabra et laevia, sub lente tantum minutissime punctulata, nervis secundariis tenuibus vix curvatis angulo ca. 50 60° a primario abeuntibus. Folia caulina inferiora late vel ovato-lanceolata vel oblongo-lanceolata, 12 18 cm. longa, 4–5.5 cm. lata, latitudine 2.5–4-plo longiora, infra medium latissima, basi late cuneata vel subrotundata, apice sensim angustata, petiolata. Petioli dimidia latitudine folii breviores. Folia caulina superiora et folia ramealia minora brevius petiolata, basi angustius cuneata, apice brevius acuminata. Rami inflorescentiae ± breves singuli simplices, rarius inferiores elongati iterum ramosi, angulo 45° ab axi principali divergentes, leviter arcuati, subflexuosi, infimi tantum foliis suffulti, paniculam apertam formantes. Florum glomeruli multiflori, in statu fructifero plerumque omnes contigui, rarius infimi remoti, omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli validiusculi, in quarta circiter parte inferiore incrassato-articulati, ad basin perigonii subito paulum dilatati, perigonio fructifero subbreviores vel subaequilongi, raro paulo longiores. Perigonii foliola exteriora anguste lanceolata acutiuscula dimidiam latitudinem valvae subaequantes. Perigonii folia interiora (valvae) in statu maturo 4–6 mm. longa, 3–4 (–5) mm. lata, ambitu ovato-scutiformia basi truncata vel cordata apice acuta, margine integra vel subintegra, facie tenuiter prominenter subregulariter reticulato-nervosa, maculis nervaturae subaequalibus marginalibus vix elongatis. Color valvarum maturarum olivaceo-bruneus, consistentia tenuiter rigide coriacea. Valva unica vel omnes saepe valde inaequaliter calliferae. Callus ovato-fusiformis valde prominens ± 3 mm. longus, ± 1 mm. crassus laevis vel subrugosus, bruneo-aurantiacus. Nux matura atrofusca ca. 3 mm. longa, ca. 2 mm. lata, basi breviter, apice sublongius acuminata, vix infra medium latissima.

SYNONYMY: *R. altissimus* Wood, Class Bk. ed. 2: 477. 1847; Proc. Amer. Assoc. Adv. Sci. 1853: 177. 1856; Trelease 86. 1892; Britt. & Brown 549. 1896; Small 370. 1903; Gray 356. 1908; Woot. & Standl. 192. 1915; Rydb. R. 232. 1922; Rydb. P. 280. 1932. *R. Britannica* Meisn. apud DC. 47. 1856; Gray, Manual, editions prior to the sixth, non L. ex Gray, Proc. Amer. Acad. 8: 399. *R. Britannica β polygonifolius* Loudon ex Meisn. apud DC. 47. 1856.

ILLUSTRATIONS: Trelease, 1892, *pl. 25;* Britt. & Brown 549. 1896.

DISTRIBUTION: Lower parts of the eastern and middle United States to Arizona.

NEW HAMPSHIRE: Shelburne, border of wet field, roadside (*Deane*, Wa).

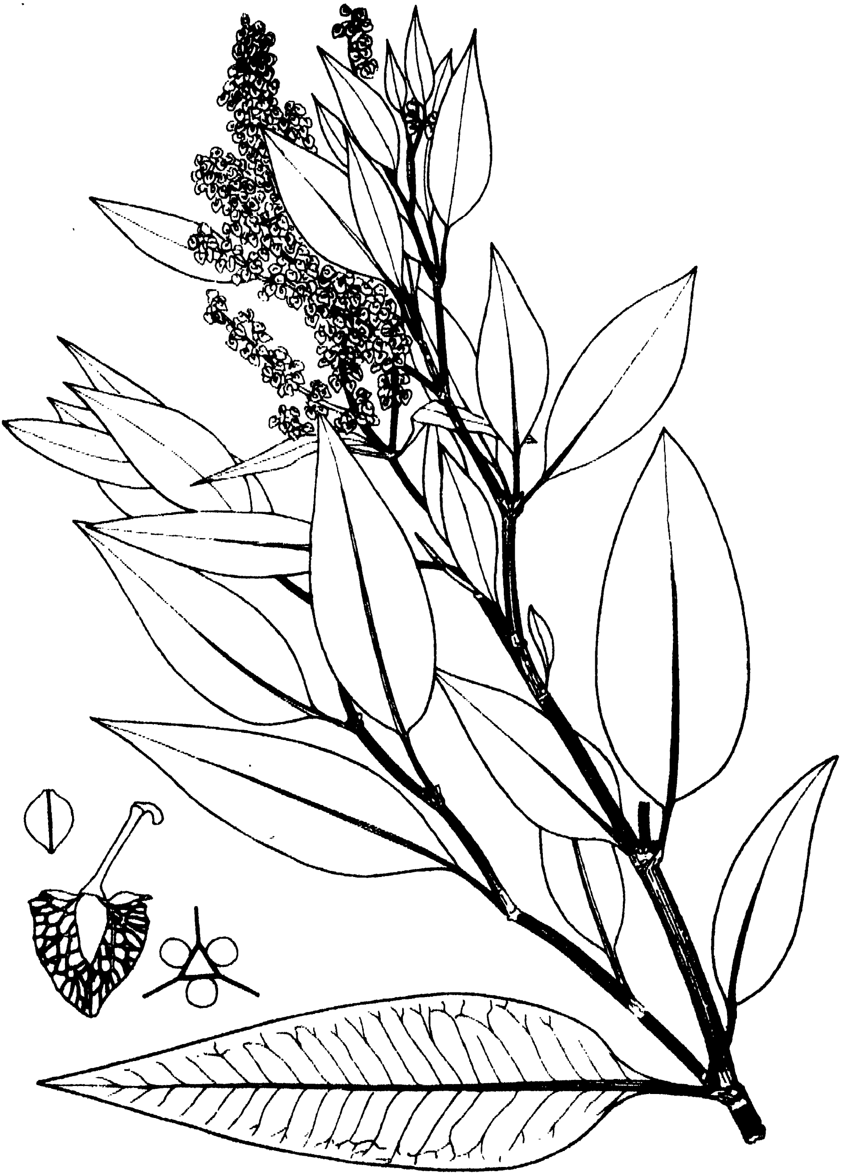


FIG. 6. *Rumex altissimus* Wood.

NEW YORK: Along abandoned railway to marble quarry, Gouverneur (*Phelps* 1144, Wa; 3 grains).

PENNSYLVANIA: York Furnace (*Britton*, MW; no ripe fr.). Meadville, Crawford Co. (*Garber*, Wa).

NEW JERSEY: Passaic (*Ruth*, Wa; no ripe fr.).

MARYLAND AND DISTRICT OF COLUMBIA: Washington, D. C., alluvial ground (*Steele* 22, UW; no ripe fr.). Canal bank above Chain Bridge (*Maxon & Standley* 345, Wa; no ripe fr.). River flats near Glen Echo (*House* 832, Wa; no ripe fr.). On flats at mouth of Scotts River (*Holm*, St). High Island, Potomac, Montgomery Co. (*J. D. Smith*, Wa).

VIRGINIA: Virginia side of Potomac River from opposite Analostan Island to Chain Bridge (*E. L. Morris* 67, Wa; no ripe fr.). Wet places, Little Falls of Potomac River (*C. Mohr*, Wa; 3 grains).

WEST VIRGINIA: Sandy shores of Ohio River near Wheeling (*Mertz*, Wa).

GEORGIA: Augusta (*Cuthbert*, NY; 3 grains).

MICHIGAN: Bryant's, Cheboygan Co. (*Gates* 10533, Ch; 3 grains).

INDIANA: Pine (*Duesner*, Ch; no ripe fr.). Dune region (*Peattie* 2283, Ch). Miller (*Mason Bross*, Ch).

OHIO: St. Mary, borders of streams (*A. Wetzstein*, Univ. Graz). Near Cincinnati (*Lloyd* 1993, H, Z, Lu, Bu, Cl; no ripe fr.). Ohio State Univ. Bot. Gard., Columbus (*Condit*, Ca). Cincinnati, meadows (*Lea* 11). Without locality (*Frank*, MW, H, Mu; no ripe fr.).

KENTUCKY: Paducah, McCracken Co. (*Eggleston* 4450, NY, De; no ripe fr.). Bank of Elkhorn (*Singer* 135, Wa; no ripe fr.). Without locality (*Matthes* 114, 227, MW, Be; comm. *Hooker* 837, MW, Be).

ALABAMA: Mobile, marshes (*C. Mohr*, SL; no ripe fr.). Mobile, border of swamp and ditch (*C. Mohr*, Wa).

WISCONSIN: Fort Howard, Brown Co., in moist or wet clay (*Schuette*, Ca, Ch, MW). Grant Co. (*Hasse*, Ca; no ripe fr.). Mazomanie (*Hall*, Ca).

MINNESOTA: Vicinity of Minneapolis, roadsides (*Sandberg Exch. Bur.*, Ca; 3 grains). Fort Snelling (*Mearns* 830, Wa; 3 grains). Minneapolis, wayside (*Aiton*, Ca; 3 grains).

IOWA: Ames (*Arthur*, MW; *Pammel*, NY, Wa; *Hitchcock*, Ca; *Combs & Ball* 514, Ke). Fayette Co. (*Fink*, Wa). Mt. Pleasant (*Longnecker*, La).

ILLINOIS: Wet places near Chicago (?, Wa). Grassy, vacant lots, Chicago (*Lansing* 246, Mu). Jackson Park, Chicago (?, 850, Lu).

Stony Island, Chicago (*Greenman* 2613, Wa, NY, Ke; 3 grains). Banks of the Mississippi, Oquawka (*Patterson*, Be). Marseilles (*Johnston*, Wa; no ripe fr.). Fountaindale, Winnebago Co. (*Bebb* 4, Wa, Mu). St. Clair Co. (*Mendel*, Z). Lisle, along stream (*Martmick?*, Wa; no ripe fr.). Rich soil, Wooded Island, Starved Rock, La Salle Co. (*Greenman, Lansing & Dixon* 106, Ca, Ke, MW; no ripe fr.). Vicinity of Kankakee, wet roadside (*Crampton* 116, Wa; no ripe fr.) and rocky bank (*Crampton* 373, Wa; 3 grains). Stark Co., bottomland (*Chase*, Wa; no ripe fr.). Freeport (*F. Johnson*, MW; no ripe fr.). Algonquin (*Vasey*, UW). Port Byron (*Harper*, P).

MISSOURI: St. Louis (*Engelmann*, Be, H; 3 grains). St. Louis, wet places (*Eggert*, Wa; 3 grains). St. Louis, waste ground (*Trelease*, Ko; 3 grains). Low grounds east of Missouri Bot. Garden, St. Louis (*Douglas*, Lu; no ripe fr.). St. Louis, bords des ruisseaux (*Riehl* 397, MW, Be; no ripe fr.). Am Mississippi (*Eggert* 293, Be, Bu, Z). Courtney, bottoms (*Bush* 541, 9773A, Ke, Be). Vicinity of Springfield, along the Jordan, east of town (*Standley* 9717, Wa; no ripe fr.). Vicinity of Springfield, southeast of town (*Standley* 8347, Wa; no ripe fr.). Independence (*Bush* 8, Ca). Allenton (*Letterman*, Ca; no ripe fr.).

LOUISIANA: Near New Orleans (*Matthes* 307, MW; no ripe fr.).

NEBRASKA: Ponca (*Clements* 2544, Wa; no ripe fr.). Lancaster Co. (*Milligan*, Wa).

KANSAS: Miami Co., along road between Olathe and Pleasanton (*Rydberg & Imler* 55, NY). Low ground, Riley Co. (*Norton* 451, MW). One mile northeast of Montana (*Rydberg & Imler*, NY). Five miles from Osborne City, draw bottom (*Shear* 86, Wa).

OKLAHOMA: Beaver Co., Knowles, margin of shallow pond (*G. W. Stevens* 517, Wa, Ke; no ripe fr.). Stillwater (*Waugh* 141, Wa; *C. M. Morris*, Univ. Graz; *Myers* 61, Lu). Mannsville, Johnston Co., margin of pond (*Florence Griffith* 3459, G; no ripe fr.). Norman (*Reed*, Z; no ripe fr.).

TEXAS: Tarrant Co., low, damp ground near Texas Christian Univ. (*Ruth* 604, NY, Ca). Bed of dry stream, Fort Worth (*Ruth* 123, NY, Wa). Wet, open ground, Bryan, Brazos Co. (*Palmer* 11738, SL, La, Ca, MW, Br). Wet places near Comanche (*Eggert*, SL; no ripe fr.). Wet places near Longview (*Eggert*, SL; no ripe fr.). Sonora, 660 meters (*G. L. Fisher* 2330, MW). Willis, waste places (*S. R. Warner*, SL; no ripe fr.). Dallas, damp, rich soil (*Reverchon* 796, SL); and in upland, common (*Reverchon* 2523, SL; no ripe fr.). Fort Worth (*Ruth* 41, Ch). Texline (*Griffiths* 5634, Wa). Valley, Gillespie Co. (*G. Jermy* 740, SL; leaves only). Without locality (*Thompson*, SL).

COLORADO: Foothills near Golden, 950 meters (*Jones* 270, Bu; no ripe fr.).

NEW MEXICO: Mangas Springs, 18 miles northwest of Silver City, Grant Co., 1,430 meters (*Metcalf* 775, La, Wa). Santa Rosa, 1,400 meters (*Arsène* 17027, MW).

ARIZONA: Benson (*Peebles & Loomis* 5452, Wa; no ripe fr.). Rincon Mts. (*Toumey* 280, NY).

INTRODUCED TO EUROPE: Denmark: Kjöbenhavn, Plodsved Island Brygge (*S. Andersen*, Ko).—Sweden: Småland, Kalmar (*Ekstrand*, St). Göteborg, Gamlestaden (*H. Fries*, St).

Rumex altissimus can be distinguished at once from *R. mexicanus* Meisn. by its broadly ovate (never linear) -lanceolate, elegantly acuminate leaves, recalling those of certain species of *Polygonum*, and by its larger fruiting perigonium segments with elliptic-cordate (never triangular) outline, usually bearing only one grain.

The most common type of *R. altissimus* has fruiting perigonia with only one segment bearing a grain, the others being naked. This corresponds with Wood's description of *R. altissimus:* "sepalis . . . una vel duabus tuberculatis." The var. *abortivus* Peattie, Amer. Midl. Nat. 10: 130. 1926, coincides therefore with the type. Specimens with fruiting perigonia bearing three grains are much rarer; the grains are then of very unequal size. Individuals with three equal grains are very rare.

I have not seen the type of *R. altissimus* Wood and accept here the usual interpretation of this species by Trelease and subsequent authors. But I must call attention to the following parts of Wood's description: "Foliis anguste lanceolatis . . . utrinque angustatis," which seems to make this interpretation doubtful. Earlier authors seem to have confounded this species with *R. Britannica* L. I suspect that Campdera (99. 1819) may have described it under *R. Claytonii*, but unfortunately I have failed to see Campdera's types.

Explanation of Figure 6.—*Rumex altissimus* Wood, about half natural size; cultivated at Stockholm, from seeds from the District of Columbia, *Holm*. Valves 4 times natural size, from *Crampton* 373.

13. **Rumex ellipticus** Greene. Figure 7

Perennis. Caulis procumbens vel adscendens, tenuis sed firmus, internodiis brevibus, valde flexuosus, tenuiter sulcato-striatus, pur-

purascens, a basi crebre iteratim ramosus. Rami valde flexuosi saepe elongati steriles vel serius florentes. Ochreae maiusculae pallide bruneae caducae. Folia caulina et ramealia lanceolata vel late lanceolata, plana, in sicco rigidula tenuiter coriacea, nervis lateralibus angulo 45°-60° a mediano abeuntibus, angustissime scarioso-marginata, basi cuneata, apice longe acuminata, latitudine 3-4-plo longiora, in vel infra medium latissima, petiolo latitudinem folii circiter aequante. Folia superiora sensim minora et angustiora lineari-lanceolata brevius petiolata. Rami inflorescentiae brevissimi, infimi folio suffulti divergentes et paulum remoti, superiores approximati paniculam parvam valde abbreviatam saepe compactam aphyllam formantes. Florum glomeruli omnes approximati aphylli, iam in statu florendi contigui. Perigoniorum fructiferorum pedicelli validiusculi perbreves, perigonio maturo semper breviores, prope basin articulati, in basin perigonii breviter incrassati. Perigonii foliola exteriora lanceolato-linearia, 2-2.5 mm. longa, basibus interiorum appressa. Perigonii folia interiora (valvae) in statu maturo 5-6 mm. longa, 4-5 mm. lata, ovata vel rotundato-triangularia, margine subintegra, apice obtusiuscula vel acutiuscula, facie tenuiter et subaequaliter reticulato-nervosa nervis marginem versus subevanescentibus. Valvae consistentia tenuiter membranacea omnino ecallosae vel unica callum elongatum angustissimum proferens. Nux submatura ad 3 mm. longa, ad 2 mm. lata.

SYNONYMY: *R. ellipticus* Greene, Pittonia 4: 234. 1900; Woot. & Standl. 192. 1915.

DISTRIBUTION: Texas, New Mexico, and Arizona.

TEXAS: Tom Green Co., Knickerbocker Ranch, Dove Creek (*Tweedy* 199, Wa). Near Austin (*Tharp* 1253, Wa). Paloduro Canyon, Canyon City (*Baker* 38, Wa). Low, open ground, Brownwood, Brown Co. (*Palmer* 10376, St). Low, marshy ground and old fields, San Augustine (*Brockel*, Wa; no fr.). Willis, waste places (*Warner*, SL; mixed with *R. Berlandieri*).

NEW MEXICO: Roswell, Chaves Co., fields and ditch banks, common, 1,140 meters (*Earle* 272, Wa, NY, Ke, Be, MW; type). Mangas Valley (*Wooton*, Wa; midrib of the valves somewhat thickened nearly its whole length). Near Lake Arthur (*Wooton*, Wa; see remarks under the preceding).

ARIZONA: Tucson (*Toumey* 343a, Wa; no fr.). Devil's Canyon (*Peebles, Harrison & Kearney* 4432, Wa; see remarks above).

Rumex ellipticus is very nearly related to *R. altissimus* Wood, with which it probably could be united as a subspecies. It differs,

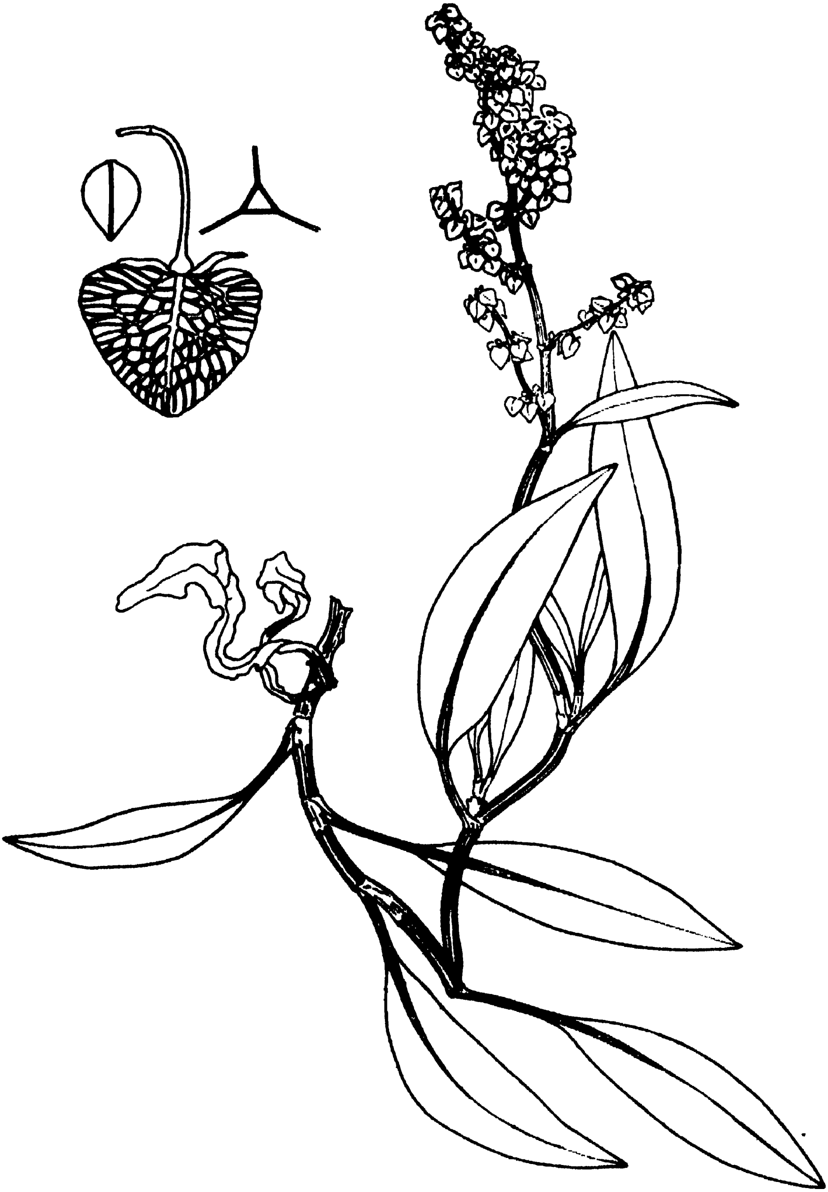


FIG. 7. *Rumex ellipticus* Greene.

however, by the usually shorter and more slender, sometimes procumbent stem, frequently smaller leaves, and, especially, by having the fruiting perigonium without grains. Sometimes one valve shows a midnerve somewhat thickened for nearly its whole length, but not grain-bearing. Perhaps such forms should be considered as intermediates between the two species. The area of *R. ellipticus* covers the most southern part of the area of *R. altissimus*.

Explanation of Figure 7.—*Rumex ellipticus* Greene, half natural size; New Mexico, *Earle* 272. Valves 4 times natural size, from *Earle* 272.

14. **Rumex Berlandieri** Meisn. nec al. Figure 8

Perennis. Caulis humilis, 40–60 cm. altus, gracilis, adscendens vel suberectus vel flexuosus, bruneus vel purpurascens, tenuiter sulcato-striatus, ochreis albidis membranaceis caducis, initio subsimplex, deinde e nodis mediis vel inferioribus ramos foliosos erecto-patulos serius florentes emittens. Folia caulina ut tota planta glaberrima et levia, in sicco crasse membranacea vel subcoriacea, ambitu lineari-lanceolata vel oblongo-linearia, inferiora basi rotundata vel subito cuneato-contracta, superiora cuneata apice obtusiuscula margine eroso-crenulata et crispata; nervi secundarii foliorum angulo ± 45° a primario abeuntes. Petiolus foliorum inferiorum crassiusculus, latitudinem laminae superans, superiorum laminae latitudine plerumque brevior. Folia parva, 5–12 cm. longa, latitudine 3.5–5-plo longiora in medio circiter latissima. Florum glomeruli etiam in statu fructifero summis tantum exceptis remoti omnes foliis non suffulti. Rami inflorescentiae primariae singuli simplices, breves, flexuosi, ab axi principali angulo ± 45° abeuntes, leviter arcuato-adscendentes, paniculam parvam apertam formantes. Perigoniorum fructiferorum pedicelli validiusculi deflexi breves, infra medium incrassato-articulati, valvae longitudine plerumque breviores vel eam ad summum aequantes, ad basin perigonii nodoso-incrassati. Perigonii foliola exteriora anguste lanceolata acuta, basibus interiorum adpressa, ca. 2 mm. longa. Perigonii folia interiora (valvae) in statu fructifero 3.5–4.5 mm. longa, 3–4 mm. lata, triangularia vel rotundato-triangularia, apice paulum protracta acuta, consistentia subcoriacea, basi truncata rarius levissime cordata, facie crassiuscule et prominenter reticulato-nervosa, reticulo subaequali, margine integra. Valvae omnes subaequaliter calliferae; callus anguste fusiformis valde prominens ± scrobiculato-rugosus ca. 3 mm. longus, ca. 1 mm. latus. Nux atrofusca, 2.5–3 mm. longa, 1.5–2 mm. lata, vix infra medium latissima.

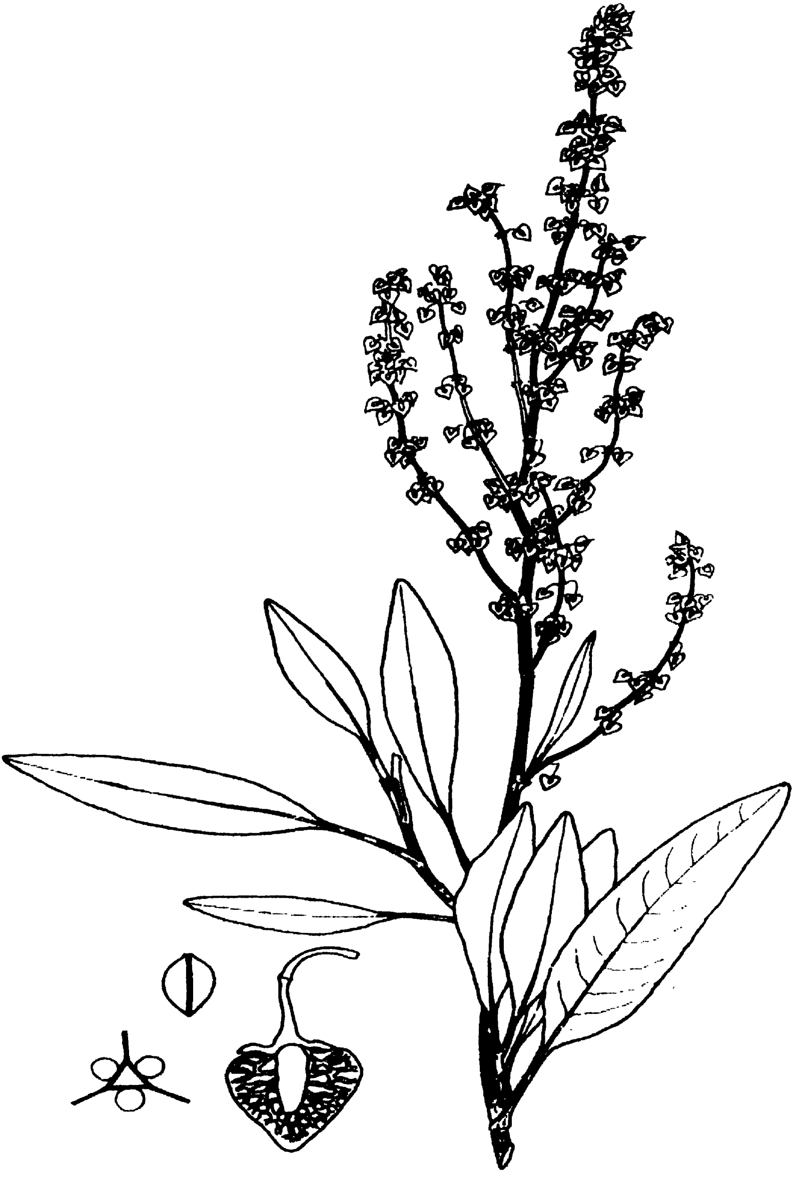


FIG. 8. *Rumex Berlandieri* Meisn.

SYNONYMY: *R. Berlandieri* Meisn. apud DC. 45. 1856, excl. syn. *R. Romassa*, non Trelease et auct. subsequent. *R. Langloisii* Small, Bull. Torrey Club 23: 405. 1896; Small 370. 1903. *R. floridanus* Trelease, 86. 1892, non Meisn.

ILLUSTRATIONS: Trelease 1892, *pl. 27* (only the habit), *pl. 24* (*R. floridanus*).

DISTRIBUTION: Louisiana, Texas, Mexico.

LOUISIANA: New Orleans (*Drummond* 281, De, Lu; type of *R. Berlandieri* Meisn.; 175, Ke; *Valle*, MW; *Joor*, Ch). Pointe à la Hache, rice fields (*Langlois* 134 or 137, Wa; type of *R. Langloisii* Small). Around Covington (*Langlois* 135, Wa). Gretna, opposite New Orleans, ditches, common (*Ball* 333, Wa). Vicinity of Cameron (*McAtee* 1950, Wa).

TEXAS: San Antonio (*Jermy* 279, G, no fr.; SL). Harris Co., wet prairies near Houston (*Eggert*, SL). Houston, moist borders (*Fisher*, Br., no fr.; Lu; 21, Wa, no fr.; 2068, Wa, no fr.; 3480, MW, no fr.). Wet, sandy ground near Morgan's Point, Harris Co. (*Palmer* 11960, Ca, Br, MW). Willis, waste places (*Warner* 20, SL; mixed with *R. ellipticus*). Evergreen Ranch, Beach (*J. F. Jones*, SL). Port Arthur, prairies (*Kolthoff*, St). Bexar Co. (*Jermy*, NY). Columbia, common on prairie and wet places (*Bush* 1589, NY; 167, SL). Goose Creek (*Fisher* 3453, MW). Galveston (*Lindheimer*, Be). Brazos Santiago (*Nealley* 82, Wa).

MEXICO: Veracruz (*Galeotti* 475, Ke, MW; no fr.). Vicinity of Tampico, Tamaulipas, 15 meters (*Palmer* 12, NY, Wa; no fr.). Michoacán, Loma Santa María, in humidis (*Arsène*, Z; no fr.). De Bejar a la Billo de . . . (*Berlandier* 419, 1699 in 1828, Ke). Without locality (*Berlandier* 115, Be; type of *R. Berlandieri* Meisn.).

I have compared Meisner's and Small's types, and there are no differences between them. Small was misled in creating his *R. Langloisii* by Trelease's wrong interpretation of *R. Berlandieri* Meisn. Most of the plants referred by Trelease to *R. Berlandieri* belong to *R. violascens* Rech. f., an annual or biennial plant without regular axillary branches, with leaves usually broadest above the middle, and much smaller, denticulate perigonia, smaller nutlets, etc. Some collectors have distributed specimens of *R. conglomeratus* and *R. pulcher* under the name *R. Berlandieri*. Trelease's misinterpretation of *R. floridanus* Meisn. has already been corrected by Small, Bull. Torrey Club, loc. cit.

R. Berlandieri is to be compared with *R. mexicanus* Meisn. It is distinguished from the latter by the somewhat dull or yellowish color when dry, by the short, subobtuse, often crisp leaves of thicker consistency with nervation somewhat prominent on the under side, by the smaller, interrupted panicle with remote whorls, by the different size and outline of the valves with more pronounced, scrobiculate reticulation, and by the different form of the nutlets.

It may be remarked that *R. Berlandieri* is very similar to the cultivated specimen of *R. chrysocarpus* Moris, Enum. Sem. Hort. Bot. Taurin. anni 1831; Mem. Reale Acad. Sci. Torino 38: 46. 1835, which I mentioned in Vorarbeiten 3: 27. That is possibly the earlier name for Meisner's plant. Moris notes Chile as the country of origin, but Meisner apud DC. 46. 1856, states: "Patria ignota, verisimiliter Mexico aut Chili." As I have not seen a spontaneous specimen of *R. chrysocarpus* from Chile in any herbarium, it seems probable that it is native to Mexico rather than Chile. Yet as long as I am unable to place definitely the type of *R. chrysocarpus*, it seems preferable to retain the name *R. Berlandieri* for the North American plant.

Explanation of Figure 8.—*Rumex Berlandieri* Meisn., half natural size, Texas, *Jermy*. Valves 4 times natural size, from *McAtee* 1950.

15. **Rumex mexicanus** Meisn. Figure 9, *a*

Perennis. Caules complures plerumque validi rarius graciles arcuato-ascendentes vel erecti, subflexuosi vel stricti, brunei vel purpureo-suffusi, ± profunde sulcato-striati, glabri laeves, 30–90 cm. alti, a basi ex axillis foliorum ramos foliosos serius elongatos et floriferos interdum iterum ramosos proferentes. Ochreae pallide bruneae vel albidae hyalinae caducae. Folia omnia consistentia in sicco rigide papyracea, colore pallide viridi, utrinque glabra et levia. Folia caulina inferiora lineari-lanceolata plana vel leviter undata, latitudine 5–7-plo longiora, basi brevius apice longius angustata. Nervi secundarii foliorum tenues, angulo ± 45° a primario abeuntes. Petioli foliorum latitudinem laminae ± aequantes. Folia caulina superiora foliaque ramorum axillariorum angustiora et brevius petiolata. Rami inflorescentiae singuli simplices vel infimi interdum ramosi et saepe elongati, omnes validi rigidiusculi omnes ± stricte erecti vel angulo acuto ± arcuato-divergentes, paniculam ± apertam sed florum glomerulis plurimis approximatis densiusculam formantes. Rami infimi tantum folio suffulti. Perigoniorum fructiferorum pedicelli validiusculi, prope basin distincte, incrassato-articulati, in basin perigonii subinflato-dilatati perigonio maturo plerumque breviores. Perigonii foliola exteriora ca. 2 mm. longa.

Perigonii folia interiora (valvae) in statu maturo 4–5 mm. longa, 3.7–4 mm. lata, ambitu late triangularia, angulis basalibus subdilatatis rotundatis, consistentia rigide membranacea subcoriacea, colore obscure vel olivaceo-bruneo, basi truncata vel subcordata, apice obtusiuscula vel acutiuscula, margine integra vel saepius imprimis basin versus minutissime et irregulariter crenulata vel erosula, facie regulariter elevate reticulato-nervosa, nervatura in utroque latere calli tres usque quattuor maculas lata. Valvae omnes subaequaliter calliferae; callus anguste fusiformis valde prominens, basi rotundatus, apice acutus 2.5–3 mm. longus, ad summum 1 mm. latus, valvae latitudine semper multo angustior, saepe leviter scrobiculato-rugosus. Nux atrofusca fere nigra ± 2.5 mm. longa, 1.7 mm. lata, infra medium latissima, basi breviter, apice sublongius acuminata.

SYNONYMY: *R. mexicanus* Meisn. apud DC. 45. 1856.

DISTRIBUTION: Mexico and New Mexico.

NEW MEXICO: Las Cruces, Dona Ana Co., 1,170 meters (*Wooton* 79, SL). Magdalena (*Herrick* 611, Wa). Navajo Indian Reservation, Shiprock Agency, 1,425 meters (*Standley* 7196, Wa).

MEXICO: Chihuahua (*Stearns* 19, Ch). Chihuahua, near Colonia García in the Sierra Madre, 2,280 meters (*Townsend & Barber* 261, Wa, Ca, Z, UW, Be, St). Durango and vicinity (*Palmer* 17, Wa; Ca, no fr.; Ke; Be, no fr.). Vicinity of Morelia, Michoacán, jardin du St. Coeur, 1,950 meters (*Arsène* 3335, Wa, NY, St, G, Ke; all of slender habit). Morelia, lieux marécageux (*Arsène* 7878, MW). Region of San Luis Potosí, 1,800–2,400 meters (*Parry & Palmer* 794, Ke; no fr.). San Luis Potosí, in paludosis ca. urbem (*Schaffner* 904, 906, Ke). Bord de l'Atoyac, près de Puebla (*Nicolás*, Wa, Ke; no fr.). Vicinity of Puebla, Rancho Posada, Puebla (*Arsène* 87, Wa, Mu; no fr.). Vicinity of Puebla, près du Cimetière, 2,170 meters (*Arsène* 2225, Wa, H; slender habit). Near Plateado, Zacatecas (*Rose* 2787, Wa, NY). Federal District, wet soil, Valley of Mexico, 2,190 meters (*Pringle* 6716, Ca, Wa, St, Be, H, Mu, Le, MW, UW; 9487, Wa, Z). Hidalgo, Sierra de Pachuca (*Rose & Hay* 6243, Wa; no fr.). Desierto de los Leones (*Ruttem* 277, Ut; no fr.). In arvis prope León (*Pl. Hartweg.* 1619, Lu; no fr.). Sonora Alta (*Coulter* 1388, Ke). Amecameca, 2,430 meters (*Fisher* 241, Ch, Wa). Contadero (*Lyonnet* 529, Wa). Chinantla (*Liebmann* 699g, Ko; without grains). Mineral del Monte, Hidalgo (*Ehrenberg* 41; type of *R. mexicanus* Meisn.). Parras (*Orcutt* 3801, Ch, Wa). Mt. Orizaba (*Seaton* 270, Wa). Toluca and vicinity (*Wawra* 1190, WM). San

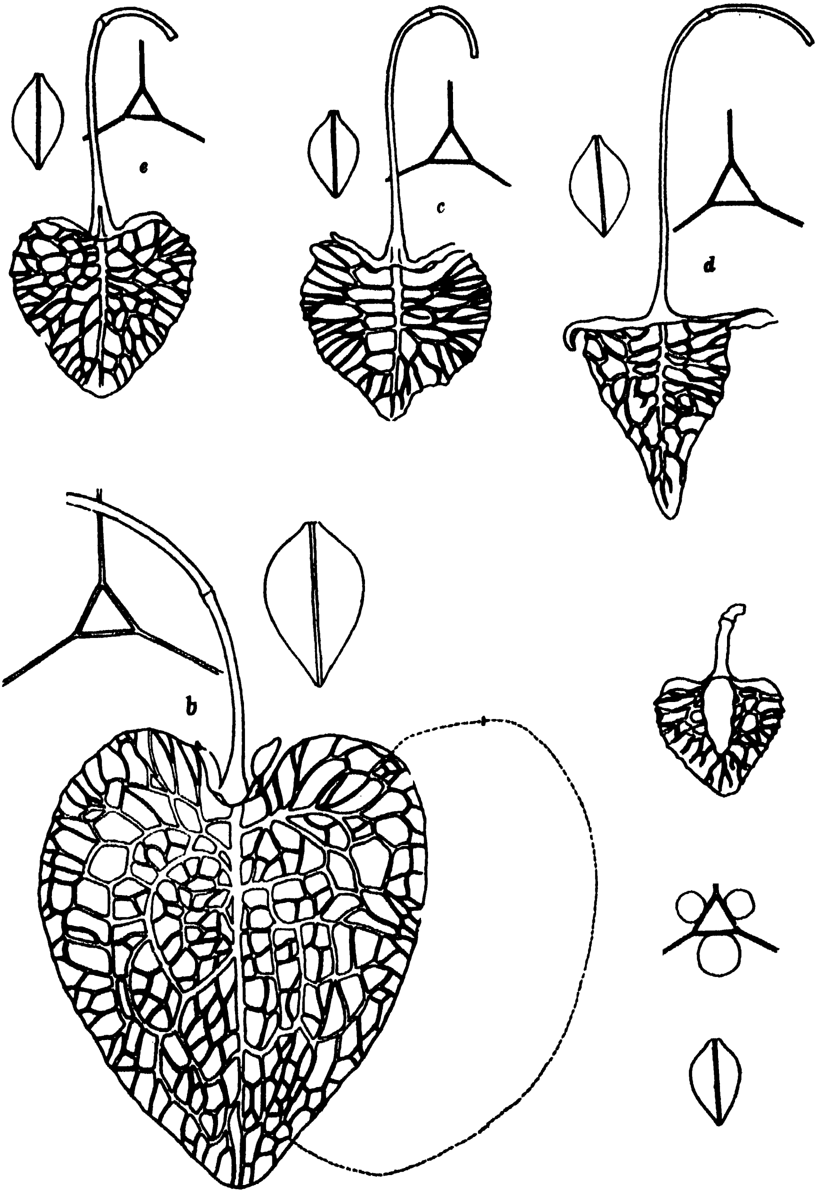


FIG. 9. Valves of (a) *Rumex mexicanus* Meisn., (b) *R. hymenosepalus* Torr., (c) *R. densiflorus* Osterh., (d) *R. pycnanthus* Rech. f., (e) *R. occidentalis* Wats.

Esteban Tacubaya, D. F. (*L. G. Ruiz* 19, Ch, Wa; no fr.). "Tierra fria" (*Schiede* 90, Be, type of *R. mexicanus* Meisn.; Lu). Without locality (*Schmitz* 284, MW; *Schaffner*, Be, no fr.; Ke).

The name *R. mexicanus* is used here in the original, that is to say, in the strict, sense of Meisner. Fernald in Rhodora 10: 17. 1908, used it in a more ample sense, including all the plants placed here under *R. triangulivalvis*. The two species are, of course, nearly related. The differences are relative and lie in the size of the fruiting perigonia and the nutlets. The reason that I have not united this to the type as a subspecies of *R. mexicanus* is rather a practical one. American botanists and especially geobotanists may appreciate having a simple binary name for the common "white dock." See also under *R. triangulivalvis*.

R. mexicanus has partly the same area as *R. Berlandieri* Meisn., but does not extend so far north and east. As to the differences between these two species, see under *R. Berlandieri*; between *R. mexicanus* and *R. altissimus* Wood, see under the latter.

Explanation of Figure 9, a.—Rumex mexicanus Meisn., valves 4 times natural size, Mexico, *Schiede*.

16. **Rumex triangulivalvis** (Danser) Rech. f. Figure 10

Perennis. Caulis singulus vel plures, primum ± stricte erectus panicula excepta subsimplex, deinde elongatus flexuosus interdum decumbens ex axillis foliorum ramos foliosos paniculas serius florentes gerentes emittens. Caulis et rami ± leviter sulcato-striati glabri laeves pallide brunei vel aurantiaco-brunei vel purpurascentes, 40–100 cm. alti. Ochreae albidae vel pallide bruneae ca. 2 cm. longae caducae. Folia caulina omnia consistentia in sicco rigide papyracea colore pallide viridi plana rarius subundulata. Folia caulina inferiora lineari-lanceolata, latitudine ± 5-plo longiora, 12–15 cm. longa, basi breviter, apice longius angustata. Nervi secundarii a mediano angulo ± 45° abeuntes. Petiolus foliorum latitudine laminae plerumque brevior. Folia caulina superiora et folia ramorum sensim angustiora latitudine ± 7-plo longiora, brevius petiolata, summa subsessilia. Rami inflorescentiae singuli simplices infimi tantum interdum iterum ramosi subelongati omnes tenues flexuosi angulo 30°–40° subarcuato-patentes paniculam sat parvam apertam formantes; florum glomeruli infimis interdum exceptis approximati. Rami inflorescentiae infimi tantum folio suffulti. Perigoniorum fructiferorum pedicelli tenues, prope basin distincte incrassato-articulati, in basin perigonii subito dilatati, perigonio maturo plerumque

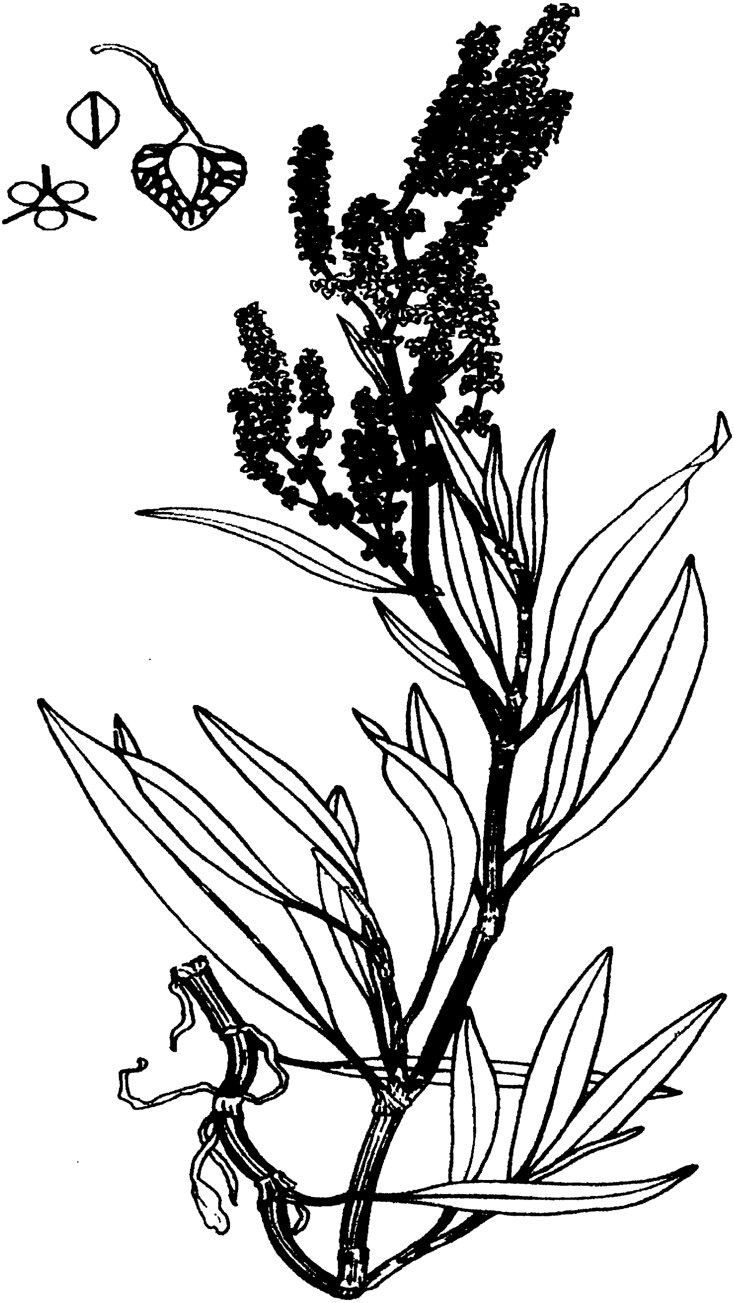


FIG. 10. *Rumex triangulivalvis* (Dans.) Rech. f.

breviores ad summum eo 1.5-plo longiores. Perigonii foliola exteriora 1.6–1.8 mm. longa. Perigonii folia interiora (valvae) in statu fructifero (1) 3 (–4) mm. longa, 2.5–3 mm. lata, consistentia rigide membranacea, colore pallide bruneo, ambitu triangularia, angulis basalibus rotundatis, basi subcordata vel truncata, apice acutiuscula, margine integra vel saepius basin versus minute irregulariter crenulata, facie subregulariter elevate reticulato-nervosa reticulo nervaturae in utroque latere calli 2–3 maculas lato. Valvae plerumque omnes subaequaliter calliferae raro 1–2 calli evanescentes (f. *unigranis* [Dans.] Rech. f.) vel deficientes; callus anguste fusiformis prominens, basi rotundatus apice acutus, 1.8–2.5 mm. longus, 0.6–0.9 mm. latus, valvae latitudine semper multo angustior, saepe leviter scrobiculato-rugosus. Nux 2 mm. longa, ± 1.3 mm. lata, atrofusca fere nigra, infra medium latissima, basi breviter apice sublongius acuminata.

SYNONYMY: *R. triangulivalvis* Rech. f. Repert. Sp. Nov. 40: 297, 1936. *R. salicifolius* Weinm. subsp. *triangulivalvis* Danser, Nederl. Kruidk. Archief 415. 1925 (appeared in 1926). *R. salicifolius* auctorum multorum, non Weinm. *R. mexicanus* Fernald, Rhodora 10: 119. 1908, non Meisn. *R. Acetosella* × *salicifolius* Svend Andersen, Bot. Tidsskrift 43: 52. 1934. *R. crispus* × *salicifolius* Svend Andersen, loc. cit.

ILLUSTRATIONS: Danser, loc. cit; Trelease 1892, *pl. 26* (*R. salicifolius*); Britt. & Brown 549. 1896 (*R. salicifolius*).

QUEBEC: Labrador, Saguenay Co., sandy shore, Romaine, Lorgondière (*St. John* 90400, O). Environs de Montréal, Longueuil, chemin de Boucheville (*Marie-Victorin* 25029, St). Environs de Montréal, Boucheville, Ile Charron (*Marie-Victorin* 27225, St; no fr.). Grèves de St. Laurent de l'Ile d'Orléans (*Marie-Victorin* 15769 bis, Lu; no fr.). Vicinity of Ottawa, Deschênes (*Rolland*, Ch, Wa).

ONTARIO: Ottawa (*Macoun* 5379, Ch; 5878, O; *Harrington* 356–8, O). Timmins (*Ostenfeld* 261, Ko). Grant Point, Nipigon Lake (*Pulling*, O; no fr.). English River (*Richardson* 23758, O). Moose Factory, James Bay (?, 62613, O; no fr.).

MANITOBA: Selkirk (*Macoun* 23752, O; no fr.). In ditches and boggy places, Brandon (*Macoun* 12916, O). Winnipeg (*Magnus*, H).

SASKATCHEWAN: Damp places, Cypress Hills (*Macoun* 5880, O; 1533, Wa). By a dry pool, Moose Jaw (*Macoun* 12855, O; no fr.). South of Wood Mountain (*Dawson* 78763, O). Lake Manitou, along the line of Grand Trunk Railway (*Macoun & Herriot* 76815, O). Moose Mt. Creek (*Macoun* 23751, O; no fr.). South of Battleford, borders of salt marshes (*Macoun* 23753, O). Without locality (*Bourgeau*, MW, St).

ALBERTA: At camp in Crook Flat, sage bank (*Macoun* 12917, O). Boggy ground, Bow River, Calgary (*Moodie*, Wa; no fr.). Craigmyle (*Brinkman* 868, Ch).

BRITISH COLUMBIA: Near marshes, Nelson (*Macoun* 23748, O). Sumas Lake (*Macoun* 54770, O). Wet places, Trial (*Macoun* 67976, O). Saline soil, Kamloops (*Macoun* 23759, O). Billy River (*Dawson* 114109, O). Saline soil, Garnetts Ranch, Old Mans River (*Dawson* 23750, O). Crow Nest Pass (*Macoun* 24678, O). District of Renfrew (*Rosendahl* 763, O).

MAINE: On wharf, Bangor (*Knight*, St).

MASSACHUSETTS: A single large clump in waste ground by railroad, Southbridge (*Weatherby*, Wa).

NEW YORK: Orient Point, Suffolk Co. (*Latham*, NY; no fr.).

OHIO: Without locality (*Frank* in 1837, H, Z).

MICHIGAN: Along railroad near Port Huron (*Dodge*, Wa). Keweenaw Co. (*Farwell*, Ch).

WISCONSIN: Shore between Point Sable and Red Banks, Brown Co. (*Schuette* 104, Ca).

MINNESOTA: Twin Lakes, Dakota Co. (*Mearns* 827, Wa).

MISSOURI: St. Louis (*Engelmann*, Be; no fr.).

NORTH DAKOTA: Leeds, Benson Co. (*Lunell*, NY). Benson Co., Butte (*Lunell*, St). Dickinson (*Holgate*, Wa).

SOUTH DAKOTA: Brookings (*Thornber*, Ca). Aberdeen (*Griffith*, Be; no fr.). Vicinity of Redfield, Spink Co., swampy, saline ground (*Ricksecker* 91, Ca; leaves only).

MONTANA: Westby (*E. L. Larsen* 152, SL). Vicinity of Glacier Park Station, alt. 1,440–1,530 meters, low prairie (*Standley* 17772, Wa). Helena (*Kelsey*, Ca; no fr.). Great Falls (?, Ca; no fr.).

WYOMING: Yellowstone Park (*Hawkins* 452e, Wa; no fr.). Yellowstone Falls, near Canyon Hotel (*Mearns* 4248, Ko). Yellowstone National Park, Snake River, margins of ponds (*A. & E. Nelson* 6436, SL). Yellowstone National Park, roadside at Petrified Tree (*H. S. Conard* 1479, MW). Swan Lake Valley, 2,400 meters (*Knowlton*, Up). Laramie (*A. Nelson* 1449, SL). Encampment, river bottom, 2,160 meters (*Tweedy* 4390, Wa). Medicine Bow Mts. (*Mann* 150, La). Rolling plains between Sheridan and Buffalo, 1,160–1,660 meters (*Tweedy* 3269, P; 3276, La).

COLORADO: Plains near Denver, 1,550 meters (*T. Holm*, Ch, SL). Denver (*Eastwood* 127, Ke). Routt Co. (*Trelease*, UW). Steamboat Springs (*Goodding* 1609, Ca). Estes Park, 2,300–2,660 meters (*J. W. Burton*, SL). Larimer Co. (*C. S. Crandall*, SL). Near La Plata, along roadsides (*Baker, Earle & Tracy* 529, MW, SL; no fr.). Region of Gunnison Watershed (*Baker* 652, SL, UW). Brighton (*Johnston* 499, SL). Cornish (*Johnston* 222, La). Leadville (*Schedin* 423, La).

NEW MEXICO: College Farm, Mesilla Park (*P. C. Standley*, Wa, SL; appr. *or.*). Santa Fe, 2,160 meters (*A. A. & E. G. Heller* 3745, SL; *or.*). Santa Fe, along ditch (*Fendler*, SL; no fr.). Patterson (*Wooton*, Wa). Rio San Jose (*H. H. Rusby*, SL). Sandbars, Navajo Indian Reservation, vicinity of Shiprock Agency, 1,425 meters (*Standley* 7878, Wa; appr. *or.*). Along creek, Brazos Canyon, Rio Arriba Co. (*Standley & Bollman* 11128, Wa; appr. *or.*). Open slope, vicinity of Chama, Rio Arriba Co., 2,380 meters (*Standley* 6607, Wa; *or.;* no fr.). Chama (*Baker* 298, SL). Gila (*Wooton*, Lu; no fr.). Las Cruces, Dona Ana Co., 1,170 meters (*Wooton* 79, Ca, UW; appr. *or.*). Mesilla Valley, Dona Ana Co. (*Wooton & Standley* 3275, P).

WASHINGTON: Grant Co., moist meadow, Grand Coulee (*Thompson* 9138, SL; *or.*). Pullman (*Piper*, P). Glacier Basin Trail, 1,500 meters. Mt. Rainier (*Jones*, P). Grand Coulee, Grant Co. (*St. John* 7672, P). Wilson Creek, Douglas Co. (*Sandberg & Leiberg* 329, P; *Lake & Hull* 651, P; both specimens with valves narrower and more pointed).

OREGON: Shore of Klamath Lake, near Modoc Point (*Coville* 1335, Wa; *or.*). East side of Klamath marsh (*Coville* 1247, Wa; *or.*). Near Fort Klamath, 1,410 meters (*Leiberg*, SL; *or.*). Eastern Grant Co., small, dried pond, Austin (*Henderson* 5651, SL; *or.*). Along ditches, Redmond (*Whited* 102, Ke; *or.*). Cache Bar, between Cache and Garden creeks on Snake River, 380 meters (*E. P. Sheldon* 8338, SL; *or.*). Crooked River, Smith Rock, Deschutes Co. (*Whited* 415, P; not typical). Margin of Strawberry Lake, Blue Mts., Grant Co. (*Cusick* 3621; not typical). Sauvies Island (*Howell*, P; valves narrower and more pointed). Hayden Island (*Gorman* 4204, P). Without locality (*Elihu Hall* 441, SL; *or.*).

IDAHO: Near stream at Mullan, 950 meters (*Leiberg* 1489, Ca, SL). Benton Co., Priest River, 810 meters (*C. C. Epling*, SL). Sandy shores, Lake Pend Oreille (*Leiberg* 110a, SL).

NEVADA: L—— River Crossing (*Griffiths & Morris* 121, Wa; *or.*).

UTAH: Fairview, 1,950 meters (*Jones* 5554i, Wa; *or.*). Morgan Co. (*Garrett* 6327, MW; *or.*). Juab, creek bottoms (*Goodding* 1072, SL; *or.*). Soldiers Summit (*Jones*, Ca; *or.;* no fr.). Kyune, 1,800 meters, in gravel (*Jones* 56031, SL; *or.*). Snyderville, Summit Co. (*Garrett* 6779, Ch; *or.*). Dry Lake, Cache Co. (*Garrett* 6479, Ch; *or.*).

ARIZONA: Bellemont (*Jones* 4075, Ca). Fort Valley, 2,175 meters, Coconino National Forest and vicinity (*Pearson* 214, Wa; appr. *or.*). Williams (*Greene*, Ch). Walnut Canyon, 1,500 meters (*Leiberg* 5781, Wa). Grand Canyon (*Millspaugh* 134, Ch).

CALIFORNIA: Butte Co., meadows at Butte, in the Canadian Zone (*Heller* 14072, Wa; *or.*). Alpine Co., Carson Spur, 2,550 meters (*Hansen* 752, Ca; *or.;* no fr.). Alpine Co., Kirkwood, 2,550 meters (*Hansen* 752, SL, UW; *or.;* no fr.).

SWEDEN: Göteborg: Gullbergsgärde (*Ohlsén* in 1925 and 1926, St; no fr.). Skåne: Malmö (*Blom*, St; *Holmberg*, Br). Kristianstad (*Blom*, St; *Lange*, St; no fr.). Ystad, ad portum (*Sandberg*, Br). Landskrona (*Nilsson*, St). Södermanland: Nacka, Hästholmen near "Tre Kronor" Mill (*Vestergren*, St). Nacka, "Svetsjo" Mill (*Laurent*). Småland: Kalmar (*Anderson*, St, De, O). Kalmar, harbor (*Trolander*, St). Ruda, railway station (*O. Köhler*, St, Br, De). Stockholm: Hästholmen (*Haegerstolpe*, St). Saltsjöqvarn (*Segerström*, St). Hammerbysjö (*Uggla*, St). Hortus Bergianus, not cult. (*Scoggren*, St). Bohuslän: Marstrand, harbor (*Blom*, St; no fr.). Västmanland, Västerås, vicinity of the harbor (*Ohlin*, St).

NORWAY: V. Aker, Storo (*Holmboe*, St; no fr.).

DENMARK: Fynen: Nyborge, harbor (*Andersen*, Ko; no fr.). Svendborg (*Andersen* 32, Ko). Andens(?), harbor (*Wiinstedt*, Ko). Jytland: Vejle Havn (*Andersen*, Ko). Horsens Havn (*Andersen* 24, Ko). Esbjeds(?) (*Andersen*, Ko). Sjaelland: Farun (*Andersen*, Ko). Aalborg, Spritfabrik (*Andersen*, cotypes of *R. crispus* × *salicifolius* and *R. Acetosella* × *salicifolius*). Kjöbenhavn, Frihavn (*Andersen*, Ko). Kjöbenhavn, Sydhavn (*Plenge* [?], Ko). Kjöbenhavn, Botanic Garden (*J. S. Wm.*, St). Amager, by Island Bridge (*Wiinstedt*, Ko).

NETHERLANDS: Schiedam (*W. D. C. Kooper*, Ut). Ooi (*W. D. C. Kooper*, Z, Ut). Zeist (*van Stenis*, Ut). Rotterdam (*Jansen & Wachter* 24567, 24584, 24585, 24587, hb. Leiden; determined as *R. salicifolius* subsp. *triangulivalvis* by Danser).

SWITZERLAND: Fosses de la campagne Prevost, bord de l'Arve, Genève (*L. Naville*, De).

GERMANY: Bavaria, München (*Harz*, Br, MW).

LETTLAND: Prov. Zemgale, Kr. Ilkuste, Demene, railway station (*Starcs*, Hb. Starcs).

This is the plant to which the name *R. mexicanus* Meisn. was applied in a more ample sense by Fernald, Rhodora 10: 19. 1908. *R. triangulivalvis* differs from *R. mexicanus* by the smaller size of valves and nutlets. The measurements given in the above description are the average obtained from a large number of specimens examined. Since such small-fruiting individuals never occur in Mexico as in the far North, I believe that the two types deserve recognition. At most they may be united as subspecies under *R. mexicanus*; see the general discussion of the *Salicifolii*, p. 12, and the discussions of *R. mexicanus* and *R. utahensis*. *R. triangulivalvis* is the only species of subsect. *Salicifolii* that occurs rather frequently introduced in Europe.

In the mountainous western parts of the United States is a form differing in some respects from the type:

Var. **oreolapathum** Rech. f.—Differt a typo caule minus elato, 20–40 cm. tantum alto, saepe crassiore, interdum profundius sulcato, ramis inflorescentiae brevioribus, inflorescentia in statu fructifero compacta, foliis minoribus saepe proportione latioribus, valvis et nucibus minoribus.—The specimens belonging to this variety are indicated in the list of specimens examined by an added "*or.*"

Not all the characters mentioned above are always to be observed together, but the tendency to develop forms showing several characters is generally obvious in the Rocky Mountains from New Mexico to Idaho.

In connection with *R. triangulivalvis* it is necessary to discuss certain critical forms which probably are nearly related to it. On account of the lack of illustrative material, I can not give any judgment on their systematic position.

(1) *R. hesperius* Greene, Pittonia 4: 234. 1899–1901; Piper 225. 1906; Rydb. R. 231. 1922.—Type locality: Bottom lands near Bingen, Washington (*Suksdorf* 2259, Ca, P; photo. of type from Greene Herbarium, MW). Stems and axillary branches slender, curved; leaves (dried) relatively thin, lanceolate, about 5 times as long as broad, narrowed to each end, the lateral nerves forming an angle of 45° with the midrib; branches of the panicle slender, strongly curved, spreading; valves triangular, the sides of nearly equal length, to 4 mm. long and wide, entire, only one with a relatively small and

narrow grain (not without grains as the author states, in error!). Among the *Rumex* material lent from Pullman, Washington, were no further specimens that agreed with Greene's type. In the New York herbarium, I saw a specimen without fruits, collected by Suksdorf at the original locality, named *R. hesperius*, with much narrower, nearly linear-lanceolate leaves; only further observation of living plants will decide whether it is a mere modification or a distinct species or a variety of *R. triangulivalvis*.

(2) Unfortunately I failed to see the type of *R. mexicanus* Meisn. var. *strictus* Peck, Proc. Biol. Soc. Wash. 47: 185. 1934, described by the author as follows: "Erectus gracillimus strictusque ramis arcte ascendentibus; foliis lineari-lanceolatis vel anguste oblongo-lanceolatis ad petiolos gradatim contractis; inflorescentia angusta ramis arcte ascendentibus; segmentis interioribus perianthii anguste ovatis minime deltoideis. Type, *Peck* 13924, in a wet meadow 8 mi. south of Burns, Harney Co., June 24, 1925. A very narrow-leaved, slender, and strict form, quite unlike the typical plant." Type in herbarium of Willamette University, Oregon. At present I can not decide whether it is a distinct unit or perhaps a variety of *R. triangulivalvis* or of another related species. I have seen specimens that seem to agree more or less with the description of var. *strictus:* California: Sierra Nevada, Salmon Creek, Tulare Co., meadow (*Hall & Babcock* 5166, Ca).—Arizona: Fort Whipple (*Coues & Palmer*, SL).—Wyoming: Danee(?) (*Pammel* 14, SL).—Nevada: White Mts., Trail Canyon, 3,000 meters, in and around springs and slowly flowing streams (*Duran* 3351, P).

(3) In the state of Washington—for instance, Wilson Creek, Douglas Co. (*Sandberg & Leiberg* 329, Ko, Up, Ca; *Lake & Hull* 651, SL)—occurs a form which is remarkably distinguished from *R. triangulivalvis* by its narrow and consequently more pointed valves, scarcely 3 mm. long and 2 mm. broad. All valves show narrow grains, nearly equal in size. The pedicels are often somewhat longer (to 1.5 times the fruit length) than those of the typical *R. triangulivalvis*. The branches of the fruiting panicle are divergent-ascending, that is, bowed, the lower whorls often somewhat remote.

Explanation of Figure 10.—Rumex triangulivalvis (Dans.) Rech. f., half natural size, Butte, North Dakota, *Lunell.*

17. **Rumex lacustris** Greene. Figure 11

Perennis. Caulis 50–90 cm. altus, tenuiter sulcato-striatus purpureo-violaceo suffusus aut (f. *aquatilis* Rech. f.) ad ½–⅔ longitudinis

simplex stricte erectus fistulosus submersus, internodiis inferioribus valde elongatis, nodis inferioribus aphyllis radiculas adventivas tantum gerentibus, parte superiore brunnescens flexuosus sparse foliosus ramosus rami tenues flexuosi foliosi divergentes inflorescentiis parvis ± contractis terminati—aut (f. *terrestris* Rech. f.) caules complures tenues decumbentes vel ascendentes, 20–40 cm. alti, a basi crebre ramosi ± papillosi. Ochreae albido-brunnescentes evanescentes. Folia consistentia in vivo verosimiliter subcarnosa, in sicco subcoriacea, colore in sicco olivaceo, ambitu oblongo- vel ovato-lanceolata, basi cuneata, apice saepe abrupte rotundato-acuminata, nervis secundariis vix conspicuis angulo ca. 45° abeuntibus. Folia margine minute crenulato-crispula imprimis in formis terrestribus subtus sub lente primum minutissime papilloso-puberula, deinde interdum glabrescentia. Petioli latitudinem foliorum inferiorum saepe multo superantes. Folia caulina superiora ad 7 cm. longa, ad summum 2 cm. lata, in medio circiter latissima. Folia ramealia proportione minora et angustiora, summa sensim angustata. Rami inflorescentiarum breves tenues singuli simplices arcuato-flexuosi paulum divergentes, infimi tantum folio suffulti. Florum glomeruli infimi remoti, ceteres contigui, omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli tenues breves, perigonio saepius breviores vel ad summum aequilongi, infra medium insensibiliter articulati, in basin perigonii infundibuliformi-dilatati. Perigonii foliola exteriora lanceolata acuta ad 1.3 mm. longa. Perigonii folia interiora (valvae) in statu maturo 2.1 2.5 mm. longa, ca. 1.5 mm. lata, ambitu ovato-linguiforma, basi angustato-rotundata, apice acuta, margine integra, consistentia membranacea, colore pallide brunea, facie tenuiter elevate reticulato-nervosa. Valvae omnes subaequaliter calliferae. Calli fusiformes duriusculi in nervum medianum valvae sensim angustati, tenuissime rugulosi vel sublaeves, 1.5–2 mm. longi, 0.5–0.6 mm. crassi. Nux matura atrofusca 2–2.2 mm. longa, 1–1.1 mm. lata, basi brevius, apice longius acuminata.

SYNONYMY: *R. lacustris* Greene, Erythea 3: 63. 1895.

DISTRIBUTION: Oregon, California.

OREGON: Shirk, 1,500 meters (*Leiberg* 2589, Wa, Ca, Be; *terr.*). Swan Lake Valley, Klamath Co. (*Applegate* 472, Wa, G; *aqu.*; no fr.). Stein's Mountain (*Howell* 535, UW; 909, Ch; *terr.*; no fr.). In dry ponds, Barren Valley (*Cusick* 1960, P, Ca, SL; *terr.*). Moist ground, north end of Summer Lake, Lake Co. (*Peck* 15698, SL; *terr.*). Shore of Goose Lake (*Austin & Bruce* 2294, Ca; *terr.*).

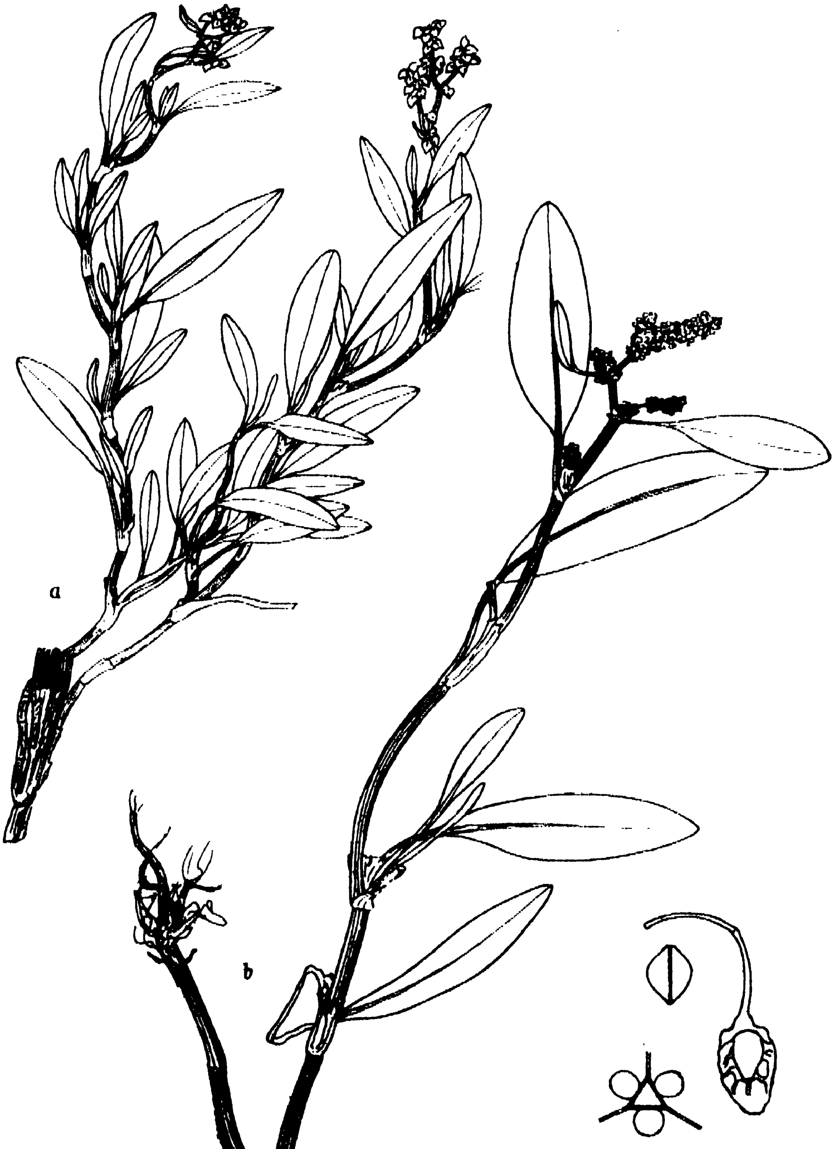


Fig. 11. *Rumex lacustris* Greene.

CALIFORNIA: Silver Lake, Lassen Co. (*Baker & Nutting*, MW; photo. of type, Hb. Greene).

This species is well characterized by its extremely small fruiting perigonia. It occurs in two ecologic types, terrestrial and aquatic, quite analogous to *Polygonum amphibium* L. This fact has been unknown till now, and this high degree of capability of accommodation to changing level or complete lack of water is unique in the genus *Rumex*. Greene has described a form of the aquatic state with tall, fistulous stems, straight upright and submerged for half or two-thirds their height. The lower and middle leaves are not developed in this case; instead of the leaves, tender adventive rootlets arise from the lower nodes. The upper leaves are emersed and somewhat pubescent, at least on the under side. But there exists also an entirely submerged form, as represented by *Applegate* 472, with large, entirely glabrous leaves. The terrestrial state is either broad- or narrow-leaved, and the leaves are pubescent usually on both sides. This is the single case of pubescence in Subsect. *Salicifolii*. The area of this interesting species is strictly limited to Oregon and California.

Explanation of Figure 11.—Rumex lacustris Greene, half natural size: (*a*) f. *terrestris* Rech. f., Oregon, *Cusick* 1960; (*b*) f. *aquatilis* Rech. f., Oregon, *Applegate* 472. Valves 4 times natural size, from *Cusick* 1960.

18. **Rumex transitorius** Rech. f. Figure 12

Perennis. Caules singuli vel saepius plures, validi arcuato-ascendentes vel suberecti, flexuosi, brunnescentes vel purpureo-suffusi, profunde sulcato-striati glabri laeves, 25–60 cm. alti, a basi in axillis foliorum ramos foliosos serius elongatos floriferos saepe iterum ramosos proferentes. Ochreae pallidae bruneae evanescentes. Folia omnia consistentia in sicco crasse membranacea, colore sordide viridi, utrinque glabra et laevia. Folia caulina inferiora lanceolata, 6–12 cm. longa, 2–2.5 cm. lata, plana, latitudine 3.5–6-plo longiora, in medio circiter vel paulum infra latissima, basi brevius, apice longius angustata. Nervi secundarii foliorum tenues, angulo ± 45° a primario abeuntes. Petioli laminae latitudinem circiter aequantes. Folia caulina superiora foliaque ramorum axillariorum angustiora et brevius petiolata. Rami inflorescentiae singuli, inferiores ramosi, superiores simplices, omnes sat validi, inferiores plerumque angulo 50°–90° subarcuato-patentes, superiores erecto-patentes paniculam apertam florum glomerulis approximatis densiusculam formantes, rami infimi tantum folio suffulti. Perigoniorum fructiferorum

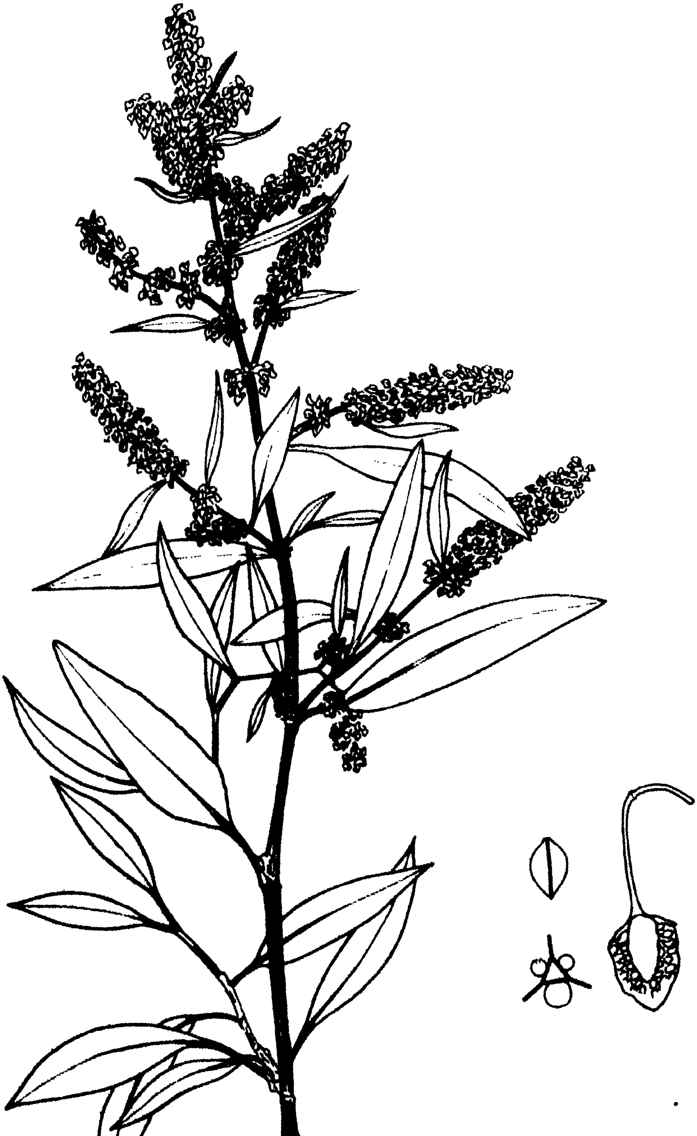


FIG. 12. *Rumex transitorius* Rech. f.

pedicelli filiformes validiusculi perigonio maturo aequilongi vel eo 1.5 (-2) -plo longiores, in quarta circiter parte inferiore distincte incrassato-articulati, in basin perigonii abrupte incrassato-dilatati. Perigonii foliola exteriora ± 1.6 mm. longa anguste lanceolata acuta. Perigonii folia interiora (valvae) in statu maturo 2.5-3 mm. longa, 2-2.3 mm. lata, ambitu ovata vel ovato-lanceolata, consistentia rigide membranacea, colore sordide aurantiaco vel atrobruneo, basi rotundata, apice acuta, margine integerrima vel subintegra, facie irregulariter interdum obsolete reticulato-nervosa reticulo in utroque latere mediani ad summum 2 maculas lato. Valva unica (var. *monotylos* Rech. f.) vel saepius omnes callum ovatum crassum prominentem basi rotundatum apice acutum ad 2 mm. longum ad 1.5 mm. crassum magnam partem valvae abscondentem ferentes; calli plerumque sublaeves. Nux atrofusca ca. 2 mm. longa, ca. 1.3 mm. lata, vix infra medium latissima, basi brevius, apice longius acuminata.

SYNONYMY: *R. transitorius* Rech. f. Repert. Sp. Nov. 40: 296. 1936. *R. salicifolius* auct. Americae borealis p.p., non Weinm.

DISTRIBUTION: Pacific United States and Vancouver Island.

BRITISH COLUMBIA: Vancouver Island, Sidney (*Macoun* 87914, O). Nanaimo (*Macoun* 1563, 83928, O). Salt marshes, Departure Bay (*Macoun* 23756, O).

WASHINGTON: Seattle, common along coast, common in moist places (*Freiberg*, SL; *E. M. Bardell*, SL). Walla Walla (*Savage, Cameron & Lenocker*, SL; approx. var. *monotylos*). Friday Harbor (*Peck* 13005, P). San Juan Island (*Reynolds*, Ch).

OREGON: Garibaldi (*Hitchcock*, 12361, Wa; no fr.). Linn Co., near Tangent (*E. E. Stanford* 1645, SL; var. *monotylos?*; no ripe fr.). Sand north of Forestry Building, Portland (*Thompson* 3717, Ke; var. *monotylos*). Corvallis, streets (*Cole & Fleischmann*, SL, Wa; var. *monotylos*).

CALIFORNIA: Samoa, Humboldt Co. (*H. H. Smith* 3866, Wa). Humboldt Co., vicinity of Eureka, waste places, not abundant, 0-150 meters (*Tracy* 1157, Ca). Butte Co., in low field along Butte Creek between Durham and Nelson, in open, treeless valley, growing with *Lasthenia, Deschampsia, Navarretia, Psilocarpus*, and *Boisduvallia*, 52 meters, widely distributed over the western half of the county (*Heller* 11396, Ca). Vicinity of Berkeley (*Walker* 172, La, Ca; *Greene*, Ca, var. *monotylos; Davy*, La). Santa Clara Co., Santa Cruz Peninsula, north embankment of Lake Lagunita, Stanford University (*Dudley*, SL, Br).

Under the name *R. transitorius* I include all the Pacific *salicifolius*-like forms with perigonium segments covered for the larger part, but never entirely, by the large grains. The leaves are often rather short and the branches of the panicle are curved-spreading. The rather rare var. *monotylos* sometimes is similar to the genuine *R. salicifolius* Weinm., but has larger fruits. Some of the 3-grained forms are similar to *R. pallidus* Bigel., but they are distinguished from that species by shorter, more globular, and rather smooth grains.

Explanation of Figure 12.—*Rumex transitorius* Rech. f., half natural size; California, *Tracy* 1157. Valves 4 times natural size, California, *Dudley* in 1897.

19. **Rumex pallidus** Bigel. Figure 13

Perennis. Caules complures tenues graciles procumbentes vel arcuato-ascendentes flexuosi, pallide virescentes vel brunnescentes vel purpureo-suffusi, tenuiter sulcato-striati, glabri laeves, 30–70 cm. alti, a basi in axillis foliorum ramulos foliosos gerentes. Ochreae pallide bruneae hyalinae valde caducae. Folia omnia consistentia in sicco rigide papyracea, colore pallide viridi, utrinque glabra et levia. Folia caulina inferiora anguste lineari-lanceolata plana vel leviter undata, latitudine 7–10-plo longiora, 10–20 cm. longa, 1.3–2.5 cm. lata, basi ut apice sensim subaequaliter acuminata. Nervi secundarii vix conspicui, a primario angulo ca. 45° abeuntes. Petioli foliorum latitudine folii plerumque breviores. Folia caulina superiora foliaque ramorum axillariorum angustiora et brevius petiolata. Rami inflorescentiae ± tenues singuli simplices vel inferiores iterum ramosi, inferiores interdum angulo recto fere divergentes, paniculam parvam vel maiusculam apertam formantes. Rami inflorescentiae infimi tantum folio suffulti. Florum glomeruli fere omnes contigui foliis non suffulti. Perigoniorum fructiferorum pedicelli in tertia vel quarta parte inferiore tenuiter sed distincte incrassato-articulati, in basin perigonii subito dilatati, perigonio fructifero breviores vel subaequilongi. Perigonii foliola exteriora 1.6–1.8 mm. longa. Perigonii folia interiora (valvae) in statu maturo 3–4 mm. longa, ± 2 mm. lata, ambitu ovato-lingulata, consistentia membranacea, colore virescenti- vel flavescenti-bruneo, basi rotundata, apice obtusiuscula vel acutiuscula, margine integra, facie inconspicue reticulato-nervosa, omnia aequaliter callifera. Callus crassus prominens, colore bruneo- vel flavescenti-aurantiaco, ca. 2 mm. longus, ca. 1–1.2 mm. latus, basi rotundatus apice acutus.

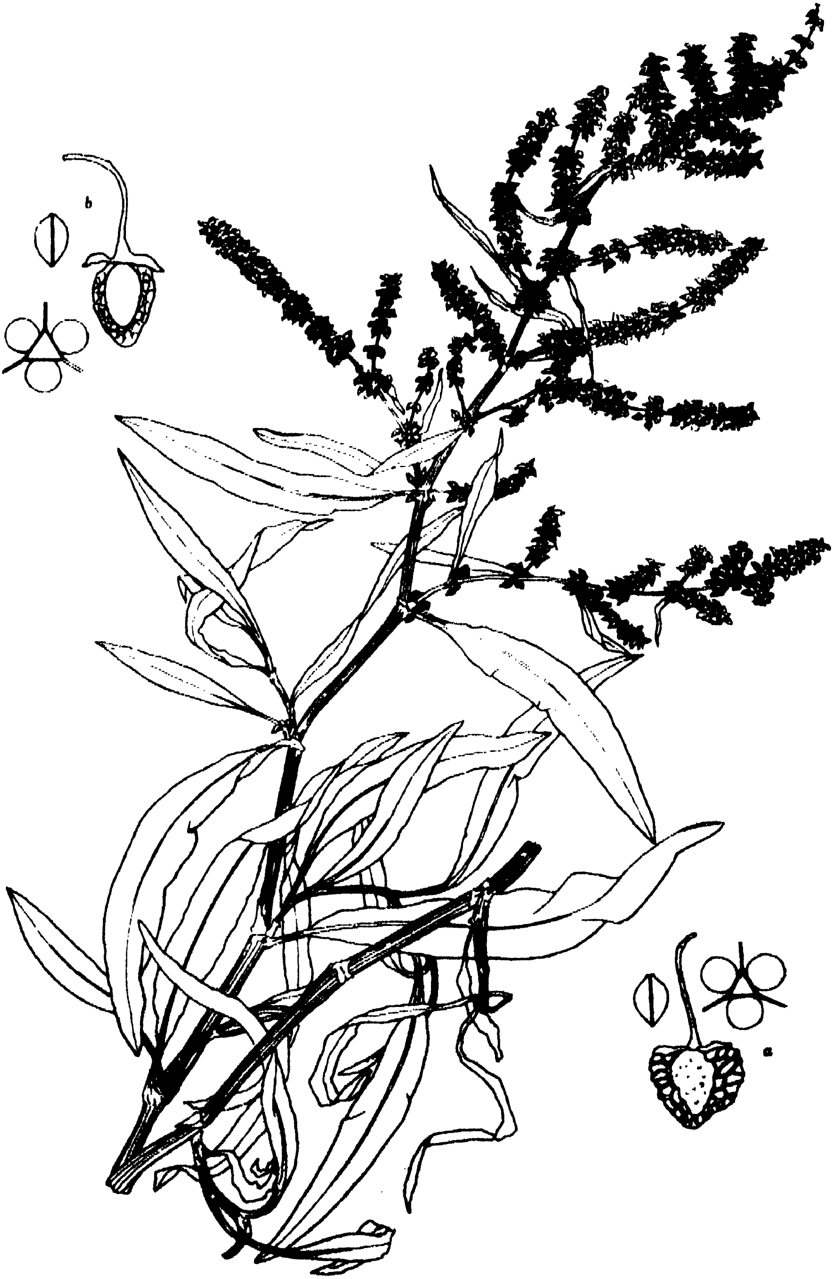


FIG. 13. *Rumex pallidus* Bigel.

Nux ca. 2.5 mm. longa, 1.1–1.2 mm. lata, atrofusca, infra medium latissima, basi breviter, apice longius acuminata.

SYNONYMY: *R. pallidus* Bigel. Flor. Bost. ed. 3. 153. 1840; Gray 355. 1908; Fernald, Rhodora 10: 19. 1908.

DISTRIBUTION: Eastern Canada, northeastern United States, Alaska.

NEWFOUNDLAND: Shores of Random Sound, Trinity Bay, red granite gravel beach, Clarenville (*Fernald & Wiegand*, O). In sand, seashore (*Jansson* 466, St).

NEW BRUNSWICK: Gloucester Co., sandy beach, Miscou Harbor, Miscou Isl. (*Blake* 5566, Wa). Gloucester Co., gravelly shore of Nepisiguit Bay, Bathurst (*Williams & Fernald* 69123, O). Campobello Isl. (*J. D. Smith*, Ca). Low, saline places, Restigouche (*Buttain* 23757, O).

NOVA SCOTIA: Yarmouth Co., gravelly and rocky sea beach, Lower Argyle (*Fernald, etc.* 21035, O, NY). Pebbly beach, Purcell's Cove, Halifax Harbor (*Howe & Long* 1590, NY). Bell's Island (*Macoun*, O).

PRINCE EDWARD ISLAND: Sandy strands and dryish borders of salt marshes, Plat River, Prince Co. (*Fernald & St. John* 11037, Wa, Ca, Ke).

QUEBEC: Seashore, Cap à l'Aigle (*Macoun* 68750, O). Beach of the River St. Lawrence, Berthier (*Fernald & Pease* 25037, O). Lower St. Lawrence, seashore, near Ceaconna(?) (*Pringle*, Wa). Rimouski Co., in fresh or brackish, rich soil in salt marsh by the River St. Lawrence, Bic (*Fernald & Collins* 1005, O).

ONTARIO: On rocks, Tobermory, Bruce Peninsula (*Macoun* 54767, O). Salt marshes, Colpays Bay, Georgian Bay (*Macoun* 23754, O).

YUKON: Dawson, Bonanza Creek (*Eastwood* 446, G). Last island in Klondike River (*Macoun* 91293, O).

NEW HAMPSHIRE: Portsmouth (*Davis*, St).

MAINE: York and vicinity (*Bicknell* 3950, NY).

ALASKA: Glacier Point, old field (*Anderson* 366, Lu). Skagway (*Setchell & Parks*, Ca; *Cowles* 847, Ch). Sitka and vicinity, about roads and lanes (*Wright* 1562, Ca; *Hultén* 8492m, Lu, MW). Kodiak Island, Three Saints Bay (*Eyerdam* 373, Lu, MW). Old Harbor, along seacoast (*Eyerdam* 648, Lu). Davidson Glacier (*Cooper & Andrews* 15, Ch). Bank of Yukon River, Anvik (*Chapman* 18, La).

Rumex pallidus is characterized and distinguished from *R. triangulivalvis* by ovate valves, all bearing large, equal grains so that only a narrow margin of the valve is conspicuous, and by the larger nutlets.

The name *R. pallidus* is used here in a more ample sense than Fernald (loc. cit.) used it, so that individuals showing the typical fruit characters but not having the characteristic diffuse panicle with rectangular, spreading lower branches or the slender stem and narrow leaves are included.

The area of *R. pallidus* in eastern Canada and in the northeastern United States seems to be rather limited. From middle and southwestern Canada I have seen no specimen belonging to this species, but from northwestern Canada (Yukon) and Alaska I have seen specimens differing not at all from some of the eastern, which have a strict habit, larger leaves, and more erect fruiting branches. *R. pallidus* seems to avoid the inland and to prefer maritime regions.

Explanation of Figure 13.—*Rumex pallidus* Bigel., half natural size; Nova Scotia, *Fernald* 21053. Valves 4 times natural size: (*a*) Nova Scotia, *Howe* 1590; (*b*) Vancouver Island, *Macoun* 83927.

20. **Rumex sibiricus** Hultén. Figure 14

Perennis. Caulis tenuis gracilis ascendenti-erectus strictus vel subflexuosus, (20–) 35 (–70) cm. altus, pallide bruneus saepe purpureo-suffusus, tenuissime sulcato-striatus, glaber laevis, plerumque a basi ex axillis foliorum ramulos foliosos emittens. Ochreae albidae brunnescentes hyalinae caducae. Folia omnia consistentia in sicco papyracea, colore pallide viridi, levissime papillosa vel glabra et levia. Folia caulina anguste lineari-lanceolata, plana vel leviter undata, latitudine 6–8-plo longiora, ad 8 cm. longa, ca. 1 cm. lata, basi et apice subaequaliter sensim acuminata. Nervi secundarii vix conspicui a primario angulo ca. 45° abeuntes; petioli foliorum 1.5–3 cm. longi. Folia caulina superiora angustiora brevius petiolata. Rami inflorescentiae tenues singuli simplices, primum suberecti, deinde inferiores quidem patentes, paniculam laxiusculam apertam formantes. Rami infimi tantum folio suffulti, florum glomeruli inferiores remoti, superiores contigui, omnes foliis non suffulti. Perigoniorum fructiferorum pedicelli prope basin tenuiter incrassato-articulati, in basin perigonii subito subinflato-dilatati, perigonio fructifero subbreviores vel aequilongi vel sublongiores: 1.5–3.5 mm. longi. Perigonii foliola exteriora ca. 1.5 mm. longa lanceolata acuta. Perigonii folia interiora (valvae) in statu maturo 2.5–3 mm. longa, 1.5–2 mm. lata, ambitu ovato-lingulata, consistentia membranacea, colore

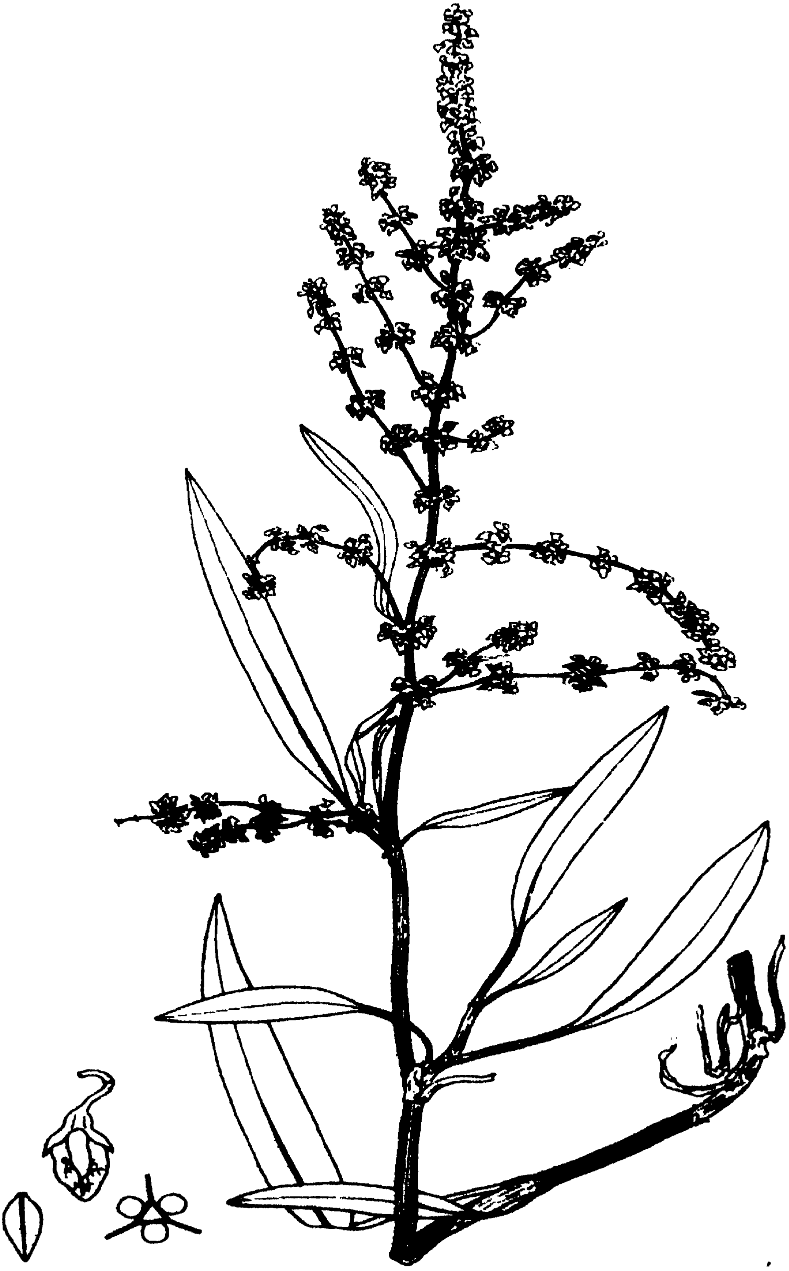


Fig. 14. ***Rumex sibiricus*** **Hultén.**

brunea, basi rotundato-angustata, apice obtusiuscula vel acutiuscula, margine integra, facie inconspicue nervosa, omnia aequaliter callifera. Callus crassus prominens, colore bruneo-aurantiaco, 1.7–2 mm. longus ± 0.8 mm. latus, acute in nervum medianum valvae abiens. Nux 2–2.5 mm. longa, 1–1.2 mm. lata, infra medium latissima, basi brevius apice longius acuminata atrofusca (punctis tenuissimis opaca).

SYNONYMY: *R. sibiricus* Hultén, Fl. Kamtchatka 2: 48. 1928 (Sv. Vet. Akad. Handl. III. 5, No. 2). *R. salicifolius* auctorum veteris orbis, non Weinm. *R. salicifolius* var. *angustifolius* Meisn. apud DC. 47. 1856.

ILLUSTRATION: Hultén, loc. cit.

DISTRIBUTION: Northern and eastern Siberia and Kamchatka.

SIBERIA: Jenisei: Sopotschnoj Island (*Lundström*, St; leaves only, mixed with *R. maritimus*); Wikandrovsky Island (*M. Brenner*, St; type of *R. sibiricus*); Plachino 68° 5′ (*M. Brenner*, St, UW; no fr.).—Oblastia Jakutsk: Kumasch-Sur, 71° 30′ (*H. N. Nilsson*, St; no fr.); Balaganach, 71° 35′ (*H. N. Nilsson*, St; no fr.); Bulun, 70° 43′ (*H. N. Nilsson*, St). Kolyma River (*Augustinowicz*, Ko, UW, MW; no fr.).

KAMCHATKA: Shtchapina (*Komarov* 4872, MW; no fr.).—For further indications, see Hultén, loc. cit.

Rumex sibiricus is the only extra-American species of the *Salicifolii*. I include it here to make the treatment of this group complete.

R. sibiricus is closely related to *R. pallidus* Bigel., but its stem is more slender, the branches of the fruiting panicle are very widespreading, the leaves usually (but not always) very thin and narrow. The principal characters lie in the much smaller fruiting perigonia with narrower, more pointed grains and smaller, narrower nutlets. Most of the specimens examined are flowering, but usually easily recognized by habit and vegetative characters.

Explanation of Figure 14.—*Rumex sibiricus* Hultén, half natural size; collected by *Brenner*. Valves 4 times natural size, *Brenner*.

21. **Rumex utahensis** Rech. f. Figure 15

Perennis. Caules complures stricte erecti rarius subflexuosi vel arcuato-ascendentes, graciles vel validi, humiles 15–40 (–60) cm. alti, tenuiter sulcato-striati, glabri, laeves, bruneo-virescentes vel purpureo-suffusi, plerumque a basi in axillis foliorum surculos foliosos proferentes. Ochreae albidae vel pallide bruneae hyalinae caducae. Folia omnia in sicco consistentia tenuiter papyracea, plana vel leviter undata, colore pallide flavescenti-viridi, utrinque glabra et laevia.

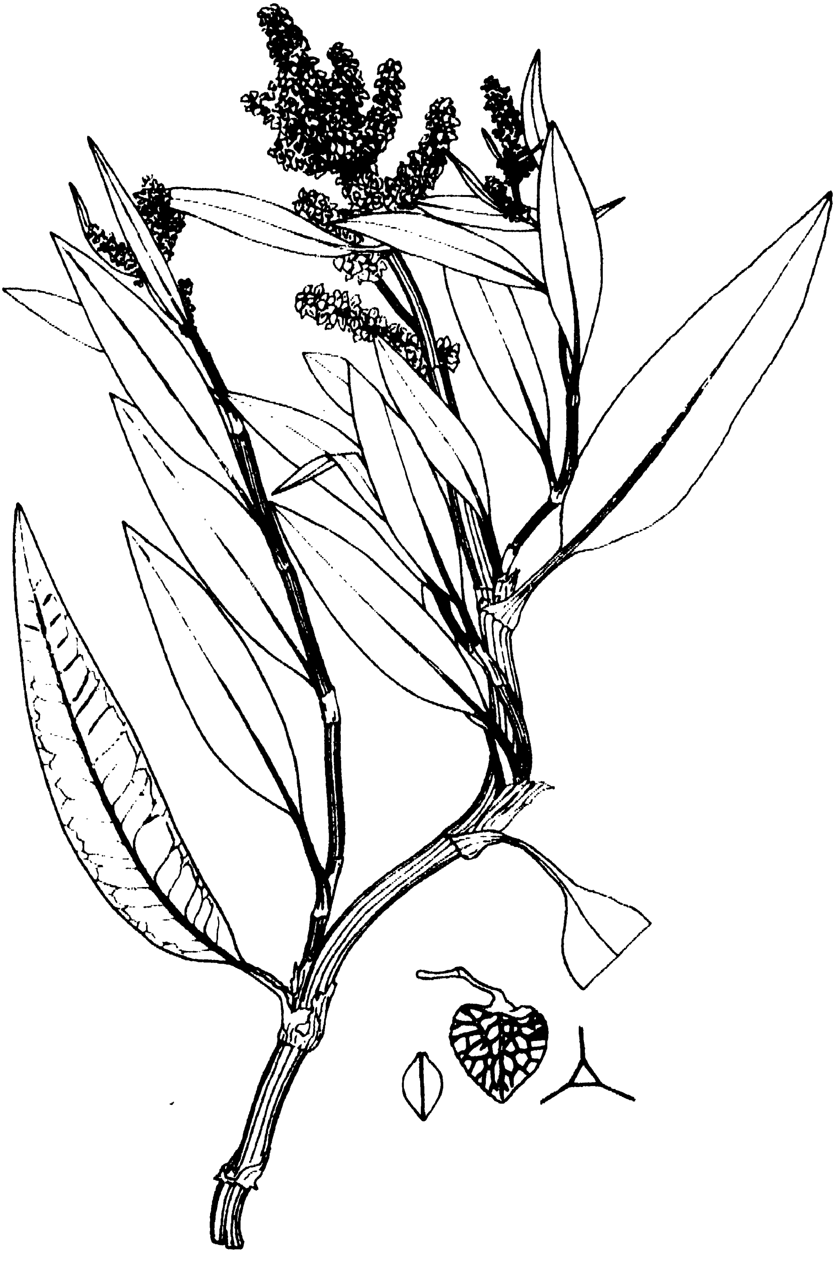


FIG. 15. *Rumex utahensis* Rech. f.

Nervi secundarii angulo ca. 45° a primario abeuntes. Petioli foliorum laminae latitudinem aequantes vel paulum superantes. Folia caulina inferiora lanceolata, latitudine 4–5-plo longiora, basi breviter, apice longius angustata. Folia caulina superiora foliaque ramorum axillariorum angustiora brevius petiolata. Rami inflorescentiae singuli simplices, breves, raro infimi elongati iterum ramosi, erecti paniculam parvam confertam compactam formantes. Rami infimi tantum folio suffulti. Florum glomeruli approximati in statu fructifero contigui. Perigoniorum fructiferorum pedicelli tenues, prope basin insensibiliter incrassato-articulati, in basin perigonii subinflato-dilatati, perigonio maturo breviores. Perigonii foliola exteriora 1–1.5 mm. longa. Perigonii folia interiora (valvae) in statu maturo 2.5–3 mm. longa et lata ambitu late scutato-deltoidea, consistentia in sicco tenuiter membranacea, colore pallide bruneo, basi truncata apice acutiuscula, margine subintegra, facie tenuiter et regulariter elevate reticulato-nervosa nervatura in utroque latere nervi mediani 3–4 maculas lata. Nervus medianus ceteris validior et magis prominens plerumque non callifer, hinc inde autem in callum minutissimum incrassatus. Nux matura 1.8–2 mm. longa, 1.1–1.3 mm. lata, atrofusca fere nigra, infra medium latissima, basi breviter, apice longius acuminata.

SYNONYMY: *R. utahensis* Rech. f. Repert. Sp. Nov. 40: 298. 1936. *R. mexicanus* Rydb. R. 232. 1922, p.p., non Meisn.; Tidestrom 160. 1925, p.p., non Meisn.

DISTRIBUTION: Rocky Mountains between 36° and 43° N. Lat.

ALBERTA: Calgary (*Macoun*, O; leaves narrow).

WYOMING: Laramie, Albany Co., in saline soil, abundant (*A. Nelson* 8083, SL).

COLORADO: Leadville (*Trelease*, SL; no fr.). Fremont Co. (*Brandegee* 191, Ca). Georgetown (*Fritchey* 16, SL; no fr.). Clear Creek Valley above Empire (*Engelmann*, SL; *Patterson*, Ch). Summit Co., near Breckenridge, 2,910 meters (*K. K. Mackenzie* 349, La, SL; *Brandegee* 6916, SL). Mesquite Creek (*Tidestrom* 4123, Wa). Manitou Park (*Trelease*, SL). Columbine Ranch (*Hedgcoçk* 354, La).

IDAHO: Lewiston, Nez Perce Co. (*Heller* 3236, Ca).

UTAH: Wasatch Mts., Peterson Canyon, 2,400–3,000 meters (*Pammel & Blackwood* 3957, SL). Head of Middle Fork of Manti Canyon (*Coville & Tidestrom*, Wa). Ephraim Canyon, 2 miles below summit, 2,700 meters (*Tidestrom* 307, Wa). Wasatch Plateau, east of Ephraim (*Tidestrom* 214, 2468, Wa). Common in ponds, aspen zone, Ephraim Canyon, 2,400 meters (*Tidestrom* 1249, Wa; no fr.).

Abundant on rocky slope, Eccles Canyon, east of Mt. Pleasant, 2,880 meters (*Tidestrom* 1880, Wa). Prince Canyon at Kyune, 1,950 meters (*Jones* 5603j, Wa). Divide between Sevier and Beaver rivers, near Belknap Peak (*Rydberg & Carlton* 7336, Wa; no fr.). Huntington Canyon, Emery Co. (*Garrett* 7019, Ch).

NEVADA: Slide Mountain, in granite, 2,340 meters, Washoe Co. (*Heller* 10952, NY, Ke; no fr.). Washoe Co., Mt. Rose, 2,895 meters (*Heller* 10654, Wa). Drying mud bottom, 1,740 meters, Mountain City (*Nelson & Macbride* 2181, Be, St).

OREGON: Hood River Co., Columbia River bottoms (*Henderson* 493c, f, SL).

LOCALITY INDEFINITE: Rocky Mts., Lat. 39°-40° (*Hall & Harbour* 496, Wa, SL, De, MW). Porcupine River (*D. Smith* 196, Ke). "S. Utah, N. Arizona, etc." (*Palmer* 421, SL).

The valves of *R. utahensis* are small and without tubercles, and in this respect similar to those of *R. californicus* Rech. f., having more pronounced teeth on the margin, but the habit of these two species is usually very different. *R. utahensis* has short and stout, little branched stems, relatively broad leaves, and a small and very contracted fruiting panicle. *R. californicus*, on the contrary, has elongate, slender, much branched stems, narrow leaves, and an elongate, somewhat lax panicle. The plant described by Jepson, 292, 1923, as *R. salicifolius* var. *montigenitus* shows intermediate characters between *R. californicus* and *R. utahensis*.

Flowering specimens of *R. utahensis* are not to be distinguished from *R. triangulivalvis* var. *oreolapathum* Rech. f., because the habit of this Rocky Mountain variety of the widespread *R. triangulivalvis* is exactly the same. I believe that *R. utahensis* is nearly related to *R. triangulivalvis* var. *oreolapathum*, and that the first may be considered a grainless parallel type of the latter. As this grainless type is strictly limited to the Rocky Mountains and occurs there in the same areas as *R. triangulivalvis* var. *oreolapathum*, without intermediates, it gives the impression of a certain independence and may be maintained for the present as a distinct species.

Explanation of Figure 15.—*Rumex utahensis* Rech. f., half natural size; Utah, *Jones* 5603j. Valves 4 times natural size, from *Tidestrom* 307.

22. **Rumex crassus** Rech. f. Figure 16

Perennis. Caules complures validi procumbentes vel flexuoso-ascendentes, 20–50 cm. longi, basi levius apicem versus profundius

sulcato-striati, glabri laeves, bruneo-virescentes vel purpureo-suffusi, a basi ex axillis foliorum ramos foliosos serius elongatos floriferos proferentes. Ochreae pallide bruneae hyalinae caducae. Folia omnia in sicco consistentia crasse et rigide coriacea, colore olivaceo vel obscure viridi vel brunnescente subtus pallidiore, utrinque glabra et levia. Nervi secundarii foliorum angulo 45°–60° a primario abeuntes. Petioli laminae latitudinem aequantes vel superantes. Folia caulina inferiora ovato- vel oblongo-lanceolata, plerumque infra medium latissima, latitudine (2–) 2.5–3.5 (–4) -plo longiora, basi anguste vel late cuneata vel interdum fere rotundata, apicem versus angustata, acuta. Folia caulina superiora foliaque ramorum axillariorum angustiora brevius petiolata. Rami inflorescentiae breves validi singuli simplices, infimi tantum folio suffulti, florum glomerulis omnibus approximatis in statu fructifero contiguis, paniculam ± parvam compactam confertam formantes. Perigoniorum fructiferorum pedicelli validi, in tertia vel quarta parte inferiore incrassato-articulati, ad basin perigonii nodoso-incrassati, perigonio maturo (1–) 1.5 (–2) -plo longiores. Perigonii foliola exteriora ca. 2 mm. longa. Perigonii folia interiora (valvae) in statu maturo 4–5 mm. longa, 3–4 mm. lata, ambitu ovato- vel deltoideo-lingulata, consistentia in sicco membranaceo-coriacea, colore atrobruneo-purpureo, basi rotundata, apice acuta, margine minute irregulariterque crenulato-denticulata. Valva anterior callum maximum ovatum ± 4 mm. longum, ± 2.5 mm. crassum, totam fere faciem valvae abscondentem ferens, valvae ceterae valide reticulato-nervosae, nervo mediano ceteris crassiore ± plerumque autem non callifero, rarissime callum minutum proferens. Nux matura 2–2.5 mm. longa 1.7–2.1 mm. lata vix infra medium latissima basi rotundata, apice breviter acuminata.

SYNONYMY: *R. crassus* Rech. f. Repert. Sp. Nov. 40: 295. 1936. *R. salicifolius* Fernald, Rhodora 10: 78. 1908, non Weinm.; Watson 8. 1880, p.p.; Trelease 87. 1892, p.p.; Jepson 292. 1923, p.p.

DISTRIBUTION: California, Oregon.

OREGON: Beach, Newport, Lincoln Co. (*Spillman*, P, Ch). Beach, Seal Rock, Lincoln Co. (*Peck* 10575, Ch).

CALIFORNIA: Northern coast region, edge of salt marsh, Samoa, Humboldt Bay, 0–150 meters (*Tracy* 2549, Ca). San Mateo Co., Farallon(?), seashore (*Skottsberg*, Up). San Mateo Co., partially stabilized sand dunes, 2 miles south of Pigeon Point (*E. A. Purer* 5373, SL). Lassen Co. (*Baker & Nutting*, Ca). Near Eagle Lake, Lassen Co. (*Baker*, Ca). San Francisco (*Ponten*, Up; *N. J. Andersson*, Up, St; *Grunow*, MW; ?, SL). Pt. Lobos, San Francisco (*Eastwood*

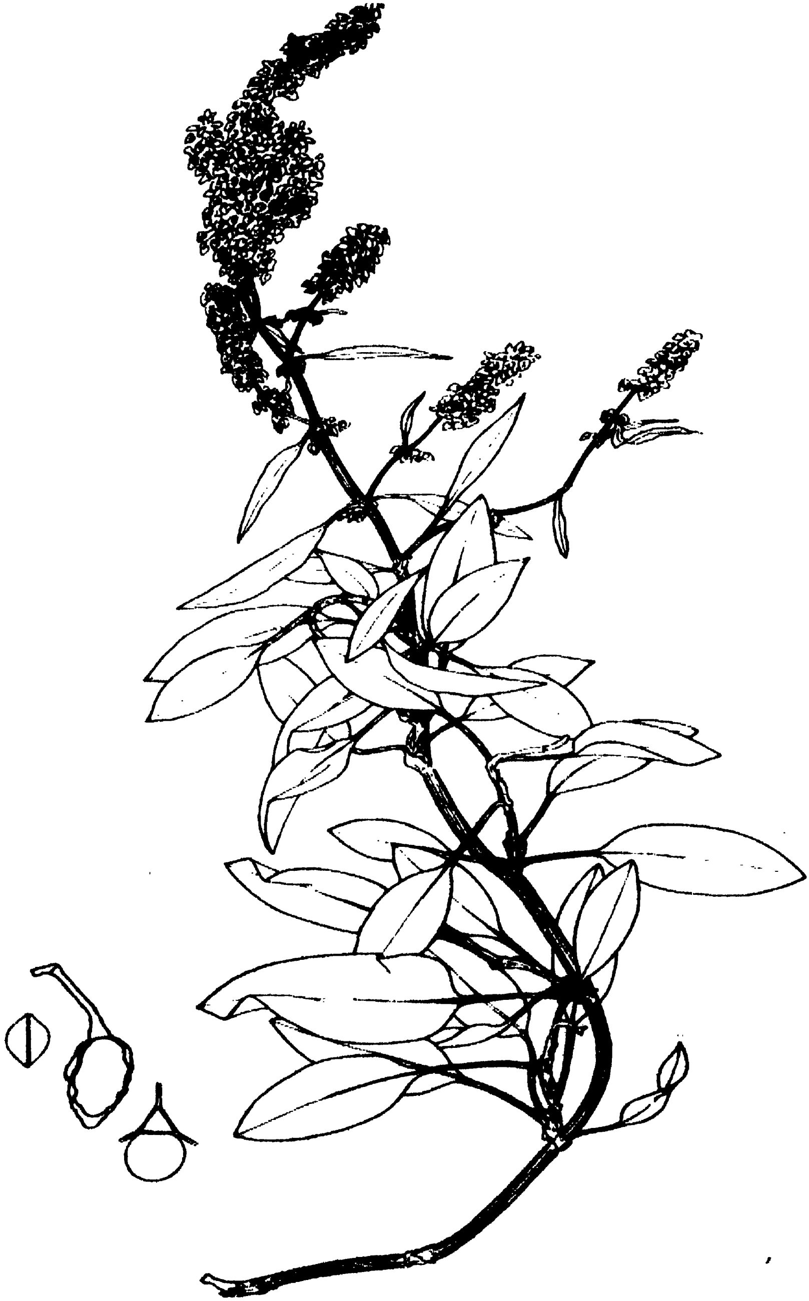


FIG. 16. *Rumex crassus* Rech. f.

1565, SL). Beach near Cliff House, San Francisco (*Heller*, SL). Sea strand, Cliff House (*Engelmann*, SL). Pacific Grove, Monterey Co. (*Elmer* 4084, Ca, G). Wet places down beach cliffs south of Pacific Grove (*F. M. Muller*, Ut). Oakland (*B. Davy*, Ca). Santa Cruz (*C. S. Anderson*, SL). Santa Cruz Mts. (*Kellogg*, K, M; *McLean*, SL). Santa Cruz, sand dunes along coast (*C. N. Thompson*, SL). San Pedro (*Hinds* 1941, Ke). Berkeley (*Blankinship*, SL). Bolinas Bay (*B. Davy* 1212, Ca). Farallon City (*Setchell*, Ca). Am Strande im Tennessee Tale (*Suksdorf* 466, P).

This species has been taken by Fernald in Rhodora (loc. cit.) for the genuine *R. salicifolius*, which it resembles in that only one of the inner fruiting perigonium segments bears a very large and swollen grain covering nearly the whole surface of the segment; but the leaf measurements given by Weinmann do not agree with this plant. The fruiting perigonia and the nutlets of *R. crassus* are more than twice as large and the leaves are shorter and broader, the stem often procumbent or ascending. The habit of *R. crassus* is peculiar and hardly to be compared with that of other species of the *Salicifolii*.

Explanation of Figure 16.—Rumex crassus Rech. f., half natural size; San Mateo, California, *Skottsberg*. Valves 4 times natural size; San Francisco, *Andersson*.

23. **Rumex salicifolius** Weinm. Figure 17

Perennis. Caulis ascendens vel erectus, flexuosus, tenuis sed firmus, 30–90 cm. altus, tenuiter sulcato-striatus, bruneus saepe purpureo-suffusus, plerumque a basi ramos foliosos serius florentes et elongatos arcuato-divergentes emittens. Ochreae bruneae membranaceae caducae. Folia omnia plana, glabra et laevia, consistentia in sicco rigide coriaceo-membranacea, colore pallide olivaceo, angustissime membranaceo-marginata, nervi laterales angulo ± 45° a mediano abeuntes. Petiolus folii laminae latitudinem aequans vel paulo superans. Folia caulina inferiora anguste lanceolata, basi apiceque aequaliter sensim angustata, latitudine ± 7-plo longiora, ad 13 cm. longa. Folia caulina superiora et folia ramealia sensim minora et angustiora. Rami inflorescentiae tenues tenaces singuli simplices, ab axi principali angulo ca. 45° arcuato-patentes, infimi tantum folio suffulti, paniculam saepe elongatam ± apertam formantes. Florum glomeruli infimi remoti, superiores contigui compacti, omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli perigoniis maturis (1–) 1.5 (–2) -plo longiores, tenues sed firmi, prope basin tenuiter incrassato-articulati, ad basin perigonii subito ali-

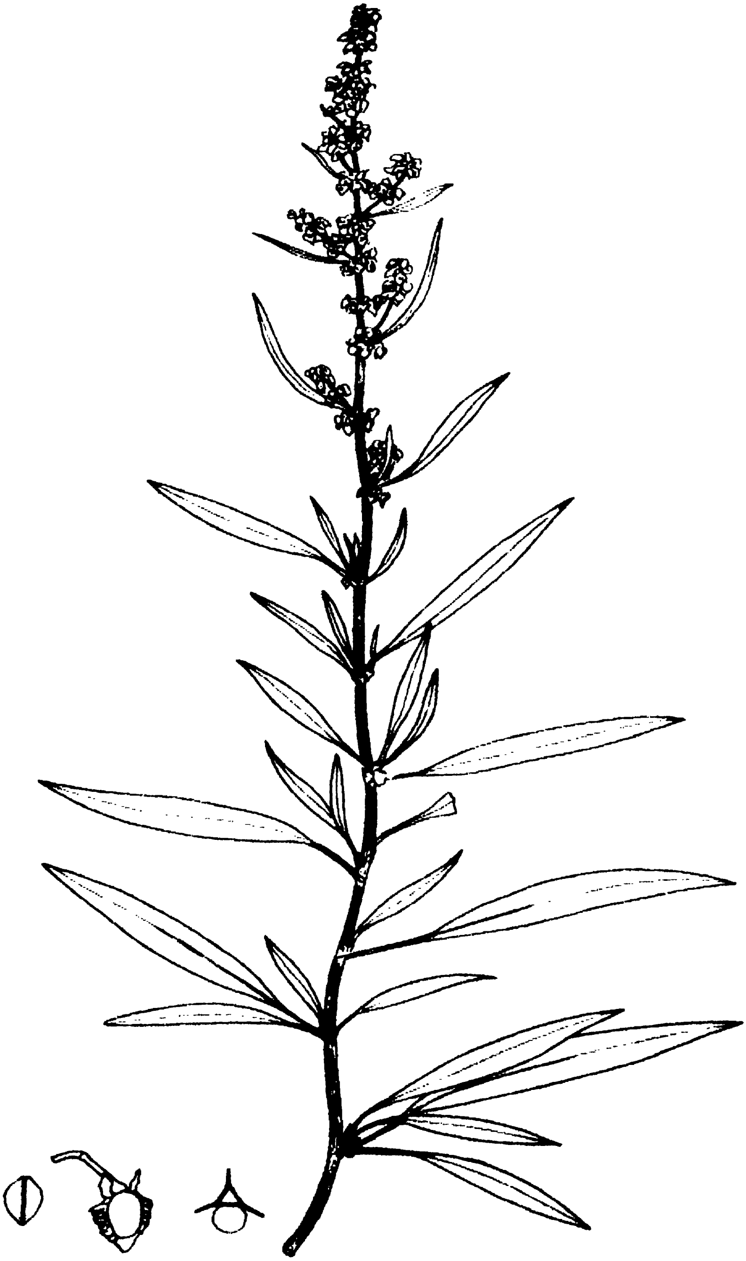


Fig. 17. *Rumex salicifolius* Weinm.

quantum incrassati. Perigonii foliola exteriora anguste lanceolata acuta basibus interiorum appressa, 1.2–1.5 mm. longa. Perigonii folia interiora (valvae) in statu maturo 2.3–3 mm. longa, 1.7–2.1 mm. lata, consistentia coriaceo-membranacea, colore bruneo-rufescenti, ambitu deltoideo, apice acuta, margine subintegra vel minutissime irregulariter denticulata. Valva anterior callum magnum ovatum totam fere faciem valvae abscondentem proferens, valvae alterae plerumque ecallosae, facie tenuiter prominenter reticulato-nervosae, nervo mediano ceteris validiore. Nux matura atrobrunea, 1.8–2 mm. longa, 1.1–1.3 mm. lata, basi brevius, apice longius acuminata, paulum infra medium latissima.

SYNONYMY: *R. salicifolius* Weinm. Flora 4: 28. 1821; Meisn. apud DC. 47. 1856, p.p.; Watson 8. 1880, p.p.; Trelease 87. 1892, p.p.; Jepson 292. 1923, p.p. (non Fernald, Rhodora 10: 18. 1908). *R. salicifolius* subsp. *angustivalvis* Danser, var. *unigranis* Danser, Nederl. Kruidkund. Archief 415. 1925 (appeared in 1926).

ILLUSTRATIONS: Danser, op. cit. *f. 1, 3–5.*

DISTRIBUTION: Middle and southern California; northern Mexico.

CALIFORNIA: San Bernardino Co., dry, sandy bank of Santa Ana River (*Parish* 11239, Ca, SL; 1507, UW). Santa Catalina Isl. (*L. W. Nuttall* 854, SL; 326, Ch; 854, Ch). Santa Catalina Isl., Avalon (*Blanche Trask*, SL). San Clemente Isl., vicinity of Mosquito Harbor (*Abrams & Wiggins* 366, Ca). San Clemente Isl., canyon about 3 miles southeast of Casa Blanca (*Munz* 6679, Ca; no fr.). San Diego Co., San Onofre Creek, near coast (*Abrams* 3282, SL, Ko; no fr.). San Diego Co., Witch Creek (*Alderson*, Ca). San Diego Co., Rio Juana (*Stokes*, Be). Claremont, 360 meters (*H. P. Chandler*, Ca). Mountains near Claremont (*Crawford*, Ca, SL). Santa Clara Co., bottom of Coyote Creek (*Dudley* 4133, Wa). Santa Clara Co., Saratoga (*B. Davy* 250, Ca). Los Angeles Co., Malibu (*Barber*, Ca). Los Angeles Co., Kings Canyon (*Dudley & Lamb* 4351, St). Kings River (*Eisen*, Up). Los Angeles (*H. E. Hasse*, SL). Pescadero, Monterey Co. (*F. Guirado* 695, Wa). San Francisco (*Brandegee*, SL). Santa Barbara Co. (*Baker*, Ca). Santa Barbara Co., near Mono Ranger Station, 450 meters (*A. L. Grant* 1744, SL). Alameda (*Kellogg*, Ca). Hills south of Camp 72 at Corral Hollow, Alameda Co. (*Brewer*, Wa). Santa Cruz (*Thompson*, SL). Boulder Creek, Santa Cruz Co. (*Walker* 799, Ca). Santa Cruz Isl., vicinity of Smuggler's Cove (*Abrams & Wiggins* 206, Ch, Ca). Mt. Shasta, Sisson, Lower Transitional Zone (*Setchell & Dobie*, Ca). Owens Valley and Fort Tejon (*Horn*, Wa). Mt. Pinos, Ventura Co., Lockwood Valley,

Upper Sonoran Zone, 1,560 meters, (*Hall* 6696, Ca). Bolinas Bay (*B. Davy*, Ca). Near Elsinore (*Latchie* 51, Ca). Soldiers Home (*Adams* 6, Ca). Sierra Nevada, Tehipite Valley, Fresno Co., 1,200 meters (*Hall & Chandler 494*, Ca). Samoa, Humboldt Co. (*H. H. Smith* 3866, NY). Mexican Boundary Line near White Water (*Mearns* 2302, NY). Siskiyou Co., along creek near Yreka (*Butler* 512, Ca). Without locality (*Coulter* 695, Ke; *Lambert*, Up; *State Survey* 1219, Ca).

MEXICO: Sonora (*Thurber* 324, G, Ch). San Pedro Mártir (*Brandegee*, Ca; no fr.).

CULTIVATED: "*Rumex salicifolius* mihi, e California. Ex hort. Pawl." (Up; type). "Ex Hort. Hafn., Semin. e California misit *Weinmann*" (Ko). Ex sem. Calif., cult. Athens, Illinois (*Elihu Hall*, SL, St). Cult. (*Buysman Hb. Analyt.* 1094, Ut, sub. n. *R. sanguineus*).

I have studied Weinmann's type specimen in the Upsala Herbarium and cultivated specimens in the Copenhagen Herbarium grown from seeds sent by Weinmann. The measurements of leaves given by Weinmann in his short description correspond exactly with this plant but not at all with the broad- and short-leaved, large-fruited plants taken by Fernald in Rhodora for the genuine *R. salicifolius*.

Our figure shows Weinmann's type specimen, representing an early state of development, in which the axillary branches are not yet elongate and flowering. Later the ramification of *R. salicifolius* is very abundant and then the habit is quite different, closely simulating that shown by our figure of *R. californicus*.

R. salicifolius is characterized by the small fruiting perigonia with only one segment bearing a grain; but this grain is very large and covers the whole surface of the perigonium segment.

As to the differences from the next related species, *R. crassus* Rech. f. and *R. californicus* Rech. f., see under those species. These three species are almost limited to California.

Explanation of Figure 17.—Rumex salicifolius Weinm., half natural size, type. Valves 4 times natural size, from *Dudley* 4351.

24. **Rumex californicus** Rech. f. Figure 18

Perennis. Caulis ascendens vel suberectus, 30–60 cm. altus, ± angulato-flexuosus vel strictus, plerumque gracilis sed firmus, virescens vel brunnescens, tenuiter sulcato-striatus, saepe iam a basi vel infra medium in axillis foliorum ramos foliosos arcuato-divergentes tenues flexuosos emittens. Ochreae albidae valde caducae.

Folia caulina et ramealia lineari-lanceolata ± plana, in sicco rigide subcoriacea, obscure viridia, nervi laterales vix conspicui a mediano angulo ± 45° abeuntes, ut tota planta glabra et levia, angustissime membranaceo-marginata, basin et apicem versus aequaliter sensim angustata. Folia inferiora ad 10 cm. longa, ad 1.5 cm. lata, petiolo latitudinem folii ± aequante; folia superiora sensim minora angustiora brevius petiolata. Rami inflorescentiae tenues singuli simplices, ab axi principali angulo 30° 50° arcuato-divergentes vel axi fere appressi, inferiores folio suffulti paniculam laxiusculam apertam vel densiusculam elongatam formantes. Florum glomeruli multiflori, infimi ± remoti, superiores approximati vel omnes approximati, in statu fructifero contigui omnes foliis suffulcrantibus carentes. Perigoniorum fructiferorum pedicelli in tertia vel quarta parte inferiore tenuiter incrassato-articulati, ad basin perigonii subito subinflato-dilatati, perigoniis maturis aequilongi vel 1.5 (2) -plo longiores. Perigonii foliola exteriora ovato-lanceolata acutiuscula, ± 1.8 mm. longa, dimidiam latitudinem interiorum aequantia vel paulo superantia. Perigonii folia interiora (valvae) in statu maturo ± 3 mm. longa, ± 2.5 mm. lata, ambitu late triangularia, consistentia crasse membranacea, colore fusco (bruneo-rufescente) basi truncata vel late cuneata apice acuta vix producta margine basin versus minute irregulariter denticulata, facie tenuiter sed prominenter reticulato-nervosa, nervo mediano ceteris validiore interdum longitudinaliter incrassato. Nux matura atrofusca vel fere nigra, ca. 2 mm. longa, ca. 1.3 mm. lata, basi et apice subaequaliter acuminata, paulum infra medium latissima.

SYNONYMY: *R. californicus* Rech. f. Repert. Sp. Nov. 40: 297. 1936. *R. salicifolius* auct. californ. p.p., non Weinm. *R. salicifolius* var. *denticulatus* Torr. Bot. Mex. Bound. 178. 1859.

DISTRIBUTION: California and Arizona.

OREGON: "Auf fremder Erde (ballast) oder nahe dabei," Albina, Portland (*Suksdorf*, P).

ARIZONA: Tucson (*Toumey* 343c, Wa).

CALIFORNIA: Shasta Co., near Middle Creek Station (*Heller* 7914, Ca). Oakland (*B. Davy*, Ca). Alameda Co., sandbars, Miles Canyon, Lunol (*D. Demaree* 10514, SL). Berkeley (*Blankinship*, SL; mixed with *R. crassus*). Hot Spring Valley, Lassen Co. (*Austin*, Wa). Bottom Coyote Creek, Santa Clara Co. (*Dudley* 4133, NY). Cleveland Nat. Forest, Julian (*Hitchcock*, Wa). Lake Co., Kelseyville, waste places, weed (*Blankinship*, SL). Copperopolis, Calaveras Co., 300 meters, wet ground along creek (*Tracy* 5620, Ca). Alpine, San

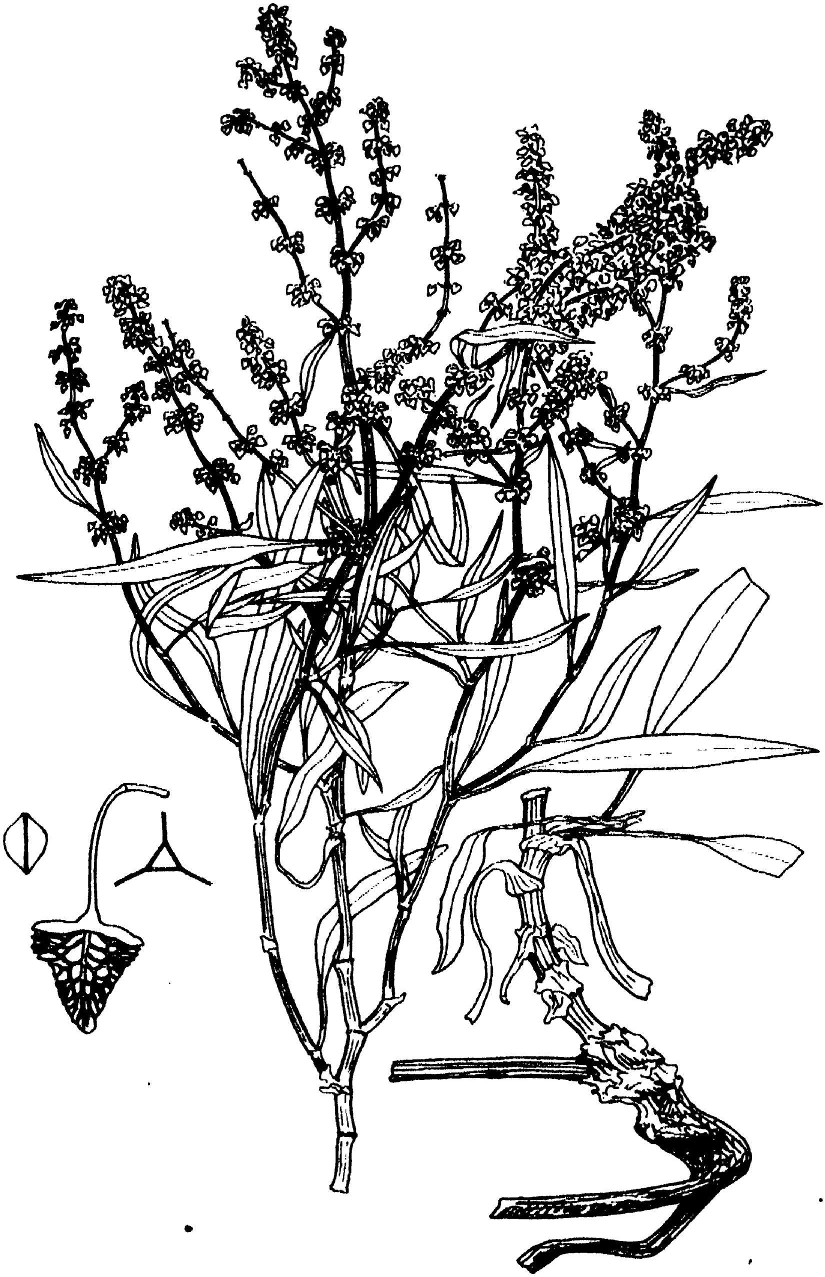


FIG. 18. *Rumex californicus* Rech. f.

Diego Co. (*Mearns* 2988, Wa). San Joaquin Co., Stockton, in sand in Calaveras River bottom (*Stanford* 436, SL). Los Angeles Co., open, sandy, moist plains (*Grant* 4432, Wa, partly). San Jacinto Mts., 1,500 meters (*H. M. Hall* 749, Wa). Saunder's Meadow, San Jacinto Mts., 1,650 meters (*C. V. Meyer* 586, Ca; type of *R. salicifolius* var. *montigenitus* Jepson). San Jacinto Valley (*Reinhardt*, Ca). Coloma (*Andersson*, St). "California" (*Alraun* 5300, NY).

Rumex californicus is characterized by small, broadly triangular valves without or with only a suggestion of a grain. The valves are finely denticulate at the margin toward the base. In habit and in shape of the leaves it is similar to the genuine *R. salicifolius* Weinm. Like that species it has often relatively long pedicels. In flower these two species can not be distinguished. Both are limited to California and Arizona.

I consider that *R. salicifolius* var. *denticulatus* Torr. must be this plant, but the name *denticulatus* can not be transferred to specific rank because there exist older homonyms by Campdera and C. Koch. *R. salicifolius* var. *montigenitus* Jepson (292. 1923) seems to form a link between *R. californicus* and *R. utahensis* (see remarks under the latter).

Explanation of Figure 18.—Rumex californicus Rech. f., half natural size; California, *Demaree* 10514. Valves 4 times natural size, from *Grant* 4432.

25. **Rumex cuneifolius** Campd.

Widely creeping, with somewhat fleshy, obovate leaves and small fruiting panicles; leaves somewhat crisped marginally, the rather short petioles and leaf nerves somewhat scabrous beneath; branches of the panicle few, short; whorls usually approximate, without leaves; pedicels thickish, shorter than the fruit, usually jointed at the middle; valves firm, triangular-ovate, entire, 4–5 mm. long, all with a prominent grain; ripe nutlets dark brown, broadest in the middle, about 2.5 mm. long.

This species of peculiar habit is widespread in southern South America and introduced to some parts of North America and Europe. The height of stems, thickness of leaves, and size of valves are variable.

SYNONYMY: Campd. Mon. Rumex 95. 1819; Rech. f. Vorarb. 3, Arkiv för Bot. 26A, No. 3: 20. *pl. 5.* 1933.

ALABAMA: Ballast, Mobile (*Mohr* 1, SL).

OREGON: Ballast at Albina, Portland (*Suksdorf* 1798, G, P; 730, 1211, P).

26. Rumex hymenosepalus Torr. Figure 9, *b*

Perennis, "with clusters of tuberous roots" (ex Rydberg). Caulis erectus vel ascendens, internodiis ± brevibus, validus fistulosus flavescens vel virescens, ± flexuosus, tenuiter sed crebre canaliculato-striatus 30–100 cm. altus. Ochreae albidae hyalinae maiusculae. Folia omnia in vivo ut videtur crasse carnosa, in sicco crasse membranacea vel subcoriacea, glabra et levia vel subtus imprimis secus nervos ± papilloso-scabra, undulata et insuper margine crispa. Folia basalia oblongo- vel anguste obovato-lanceolata, basi anguste cuneata, apice acutiuscula, rarius obtusiuscula, latitudine 3–4-plo longiora, plerumque paulo infra medium latissima. Nervi secundarii foliorum angulo ± 45° a mediano abeuntes fere recti vix arcuati. Petiolus foliorum basalium crassus, in vivo carnoso-succosus, dimidiam circiter longitudinem folii aequans. Folia caulina anguste lanceolata, basi apiceque fere aequaliter angustata, breviter petiolata, summa subsessilia. Rami inflorescentiae breves vel inferiores interdum elongati, singuli vel 3–5-ni, e basi arcuata erecti vel subpatuli, paniculam parvam rarius amplam ± contractam in statu fructifero compactam formantes; axis ramique plerumque ± flexuosi. Florum glomeruli multiflori foliis suffulcrantibus carentes in statu fructifero omnes contigui. Pedicelli fructiferi tenuiter filiformes, breves, perigonium fructiferum ad summum aequantes, in tertia parte inferiore vel paulo infra medium insensibiliter articulati ad basin perigonii subito turbinato-incrassati; inter pedicellos raro ramulus brevissimus erectus apice flores normales proferens. Perigonii foliola exteriora ca. 2 mm. longa, in emarginatione angusta foliorum interiorum reflexa. Perigonii folia interiora (valvae) in statu fructifero ambitu oblongo- vel rotundato-cordata, ex emarginatione 11–12 mm., lobis basalibus inclusis 14–15 mm. longa, 10–12 mm. lata, latitudine circiter equilonga vel evidenter longiora, consistentia tenuiter membranacea, colore pallide stramineo vel pallide carneo-bruneo, in statu iuvenili saepius purpureo- vel roseo-suffusa, margine integerrima, basi anguste et profunde sinuato-emarginata, apice obtusiuscula vel subacuta, facie regulariter et tenuiter reticulato-nervosa, nervo mediano ceteris validiore sed minime quidem callifero, reticulo marginem versus ± evanescente. Nux matura brunea, 4–5 mm. longa, ± 3 mm. lata, basi rotundato-truncata apice breviter acuminata infra medium latissima.

SYNONYMY: *R. hymenosepalus* Torr. Bot. Mex. Bound. 177. 1858; Wats. 8. 1880; Trelease 80. 1892; Small 370. 1903; Woot. & Standl. 191. 1915; Rydb. R. 231. 1922; Jepson 291. 1923; Tidestrom 160. 1925. *R. arizonicus* Britt. Trans. N. Y. Acad. Sci. 7: 73. 1889. *R. Saxei* Kellogg, Pacif. Rural Press 7: 371. June, 1879.

ILLUSTRATIONS: Trelease 1892, *pl. 18;* Bot. Mag. 121: *pl. 7433* (= var. *salinus*).

DISTRIBUTION: Southwestern United States and Mexico.

WYOMING: Bitter Creek (*A. Nelson* 4780, Wa; intermediate between *eu-hymenosepalus* and *salinus*). Bitter Creek, Sweetwater Co. (*A. Nelson* 3114, Co; type of *tuberosus* A. Nelson). Seven Mile Lake (*E. Nelson* 4332, La; var. *salinus*). Red Desert, Orenda Butte (*A. Nelson* 7141, La; var. *salinus*).

COLORADO: Sandy canyon, entrance Mesa Verde National Park (*Nelson* 421, Ca). Hillsides, Surface Creek, Mesa Grande, 1,860 meters (*Purpus* 9, Mu; *eu-hymenos.; Purpus* 9, Be; *sal.*(?); no ripe fr.). Palisades (*Crandall* 3833, P, NY, Wa; *eu-hym.*). Dry, adobe flat, 1,620 meters, Paradox, Montrose Co. (*Walker* 202; leaves only). Dry hillside, 1,620 meters, Naturita (*Payson* 233, St, no ripe fr.; P). Junction of Navajo and Spruce Canyon 1,900 meters (*Schmoll & Nusbaum* 1654, La; var. *salinus;* no ripe fr.)

NEW MEXICO: Aztec (*Baker* 296, Ca, P, Wa, Ke, Be, Z; *sal.*(?)). Gray, Lincoln Co., 1,800 meters (*Skehan* 22, MW; *eu-hym.*). Organ Mts., Dona Ana Co. (*Wooton,* Ca. no fr.). Agricultural College, Mesilla Valley, Dona Ana Co. (*Wooton,* Ch, P, Wa; no ripe fr.). Mangas Springs, 18 miles northwest of Silver City, Grant Co., 1,430 meters (*Metcalfe* 56, Ca, Wa; no ripe fr.). Sierra Co., 1 mile west of Hillsboro, 1,650 meters, sandbar (*Metcalfe* 1545, Wa, Be; no ripe fr.). Near Agricultural College (*Standley,* Wa; *eu-hym.*). Without locality (*Wright* 1782, Bo). Sandia Mts. 2,878 meters (*Castetter* 1782, La; prob. *eu-hym.*).

TEXAS: Toyah Creek (*Tracy & Earle* 90, Be; *sal.,* Wa, MW; no ripe fr.). Estelline, sandy soil (*Reverchon* 4248, Wa; no ripe fr.). Frijoles–El Paso (*Nelson* 11443, La; appr. var. *salinus*). Sweetwater, Nolan Co. (*Reverchon* 1349, Ch).

UTAH: St. George, 600 meters (*Jones* 1643, Be, UW, Bu). Santa Clara, 900 meters (*Jones* 5112, Ca, La; *eu-hym.*).

ARIZONA: Tucson (*Toumey,* Wa, no ripe fr.; Ca, NY; all *sal.*). Fort Verde (*Mearns* 300, NY, Co; type of *R. arizonicus* Britt.; no ripe fr.). Verde (*W. W. Jones,* Ca; *sal.*). Sandy river bank, Tempe

(*Ganong & Blaschka*, Be; *sal.*). Phoenix (*Kunze*, NY; no ripe fr.). In plowed fields at Calabasas (*Tidestrom* 885, Wa; no ripe fr.).

NEVADA: Scattered in sandy draws, Moapa, 500 meters (*Tidestrom* 8613, Wa, St; no ripe fr.).

CALIFORNIA: Newhall, dry, sandy soil, (*Pringle*, Wa, Ke; *sal.*). Guadalupe Ranch, Tehachapi, Kern Co. (*B. Davy* 2174, Ca; leaves only). Sand flats, South Fork Valley, 2 miles east of Weldon, Kern Co. (*Voegelin* 89, Ca; *eu-hym.*(?)). Vicinity of San Diego, in sandy fields, 60 meters (*Spencer* 141, Ca, Mu; *eu-hym.*). Oneonta, San Diego Co. (*Chandler* 5073, NY; *eu-hym.*). Santa Maria, low land near river bed (*Condit*, Ca; intermediate between *eu-hym.* and *sal.*). Whitewater (*Vasey*, Wa, Ke; no ripe fr.). Vicinity of San Bernardino, 300–750 meters (*Parish* 4634, Wa; intermediate between *eu-hym.* and *sal.*). San Bernardino Valley washes (*Parish* 11712, Ca; no ripe fr.). Sandy mesas, San Bernardino (*Parish* 678, MW; *eu-hym.*, Ca, Wa, Be, Mu; no ripe fr.). Rock Springs, 2,340 meters, San Bernardino Co. (*Ferris* 7319, NY). Antelope Valley, Llano Verde (*B. Davy* 2567, Ca; *eu-hym.*). Antelope Valley (*B. Davy* 2591, Ca; leaves only). Claremont (*C. E. Howery*, SL; no ripe fr.). Colton (*M. E. Jones*, Be; intermediate between *eu-hym.* and *sal.*, Bu; no ripe fr.). Ramona (*Brandegee*, Ca; no ripe fr.). Palm Spring, 120 meters, in sandy wash (*Jaeger* 908, Wa; intermediate between *eu-hym.* and *sal.*). Hoxin's Ranch, near Nipoma (*Brewer* 405, Wa; *eu-hym.*). Los Angeles (*Hasse*, Ch). Azusa, Los Angeles Co. (*H. H. Smith* 4929, Ch; var. *salinus*). Covina (*Grant* 1141, Ch). San Dieguito Valley (*Angier*, Ch; var. *salinus*). Pacific Beach (*Snyder*, Ch). Pasadena, sandy soil (*McClatchie*, NY; no ripe fr.). California (*Vasey* in 1881, Le).

MEXICO: Chihuahua, near San Diego (*Hartmann* 618, Wa, Ca; no ripe fr.). Vicinity of Chihuahua, 1,300 meters (*Palmer* 27, NY, Ch, Be, Wa, G; *salinus*). Northern Lower California (*Orcutt*, Ca; *eu-hym.*; Ch, *sal.*). San Quentin Bay (*Palmer* 689, Wa; *eu-hym.*).

Rumex hymenosepalus is not related to any other species. It is characterized by the tuberous roots, the somewhat succulent stems without axillary branches, large ocreae, fleshy, acuminate leaves, and large, delicate, grainless valves. From *R. venosus*, with which *R. hymenosepalus* may be compared on account of the valves, it is easily distinguished by its straight, upright, more vigorous stem, by the lack of axillary branches, much larger, thicker leaves, much smaller fruiting perigonia, etc.

Two varieties, recognizable only in fruiting state and connected by intermediates, seem to deserve designation:

Var. **eu-hymenosepalus** Rech. f., var. nov.—Nux ca. 5 mm. longa. Valvae fructiferae ambitu elliptico-cordatae, apice acutiusculae, latitudine evidenter longiores.

Var. **salinus** (A. Nels.) Rech. f., comb. nov.—*R. tuberosus* A. Nels. Bull. Torrey Club 25: 283. 1898, non L.; *R. salinus* A. Nels. op. cit. 549; Rydb. R. 231. 1922. Nux maior, ad 7 mm. longa. Valvae fructiferae ambitu cordato-orbiculares, longitudine interdum latiores.

In the list of specimens examined the names of the varieties are added.

Apart from the shape of the fruiting perigonium, the variability of *R. hymenosepalus* is inconsiderable. The leaves are flat or somewhat crisped. *Baker* 296 has broad and short leaves. The type specimen of *R. arizonicus* Britton has very gradually narrowed leaves. It has no ripe fruits, but on account of the locality it may belong to var. *salinus*. *Rumex arizonicus* may be, therefore, an older name for *R. hymenosepalus* var. *salinus*.

Explanation of Figure 9, b.—*Rumex hymenosepalus* Torr. Valves 4 times natural size. From *Jaeger* 908.

27. **Rumex densiflorus** Osterhout. Figure 9, *c*

Radice valida horizontali perennis (ex auctore). Caulis ± stricte erectus elatus 50–100 cm. altus, crasse fistulosus, flavescens vel pallide bruneus valde sulcato-striatus inflorescentia excepta non ramosus. Ochreae albidae hyalinae cito evanescentes. Folia basalia 30–40 cm. longa, 10–14 cm. lata, leviter undata vel fere plana, ambitu ovato- vel elliptico- vel oblongo-lanceolata, basi ± late cuneata vel oblique truncata raro rotundata, apice obtusiuscula vel saepius acuta, consistentia in vivo ut videtur carnosa, in sicco ± tenuiter papyracea, lamina in medio rarius infra medium latissima latitudine plerumque triplo longiora, utrinque glaberrima levis. Nervi laterales foliorum levissime arcuati vel fere recti, inferiores angulo ± 45° superiores angulo 70°–90° a mediano abeuntes. Petiolus foliorum basalium crassiusculus laminam longitudine subaequans. Folia caulina inferiora et media basalibus omnino similia sed sensim diminuta et multo brevius petiolata. Folia caulina superiora anguste ovato- vel oblongo-lanceolata, latitudine ca. 4-plo longiora. Axis inflorescentiae ± flexuosa. Rami inflorescentiae semper fasciculati, e basi arcuata ± stricte erecti vel subpatentes, paulo flexuosi,

breves vel elongati, inferiores iterum ramosi, paniculam angustam iam florendi tempore densiusculam fructificationis tempore compactam formantes. Florum glomeruli multiflori infimi ± remoti superiores approximati omnes foliis suffulcrantibus carentes. Inter pedicellos imprimis in glomerulis inferioribus hic illic ramulus brevis erectus vel ut pedicelli deflexus apice perigonia normalia proferens. Flores saepe purpureo-suffusi, antherae 1.8–2 mm. longae aureae. Pedicelli fructiferi tenuiter filiformes prope basin (in quarta circiter parte inferiore) insensibiliter articulati, perigonio fructifero (1–) 1.5 (–2) -plo longiores, basin perigonii versus paulo dilatati. Perigonii foliola exteriora anguste lineari-lanceolata ca. 2 mm. longa, basibus interiorum ± laxe accumbentia. Perigonii folia interiora (valvae) fructificationis tempore 5–6 mm. longa, 5–6 mm. lata, ambitu late rotundato-triangularis vel subcordata, basi late emarginata, apice breviter producta, acuta, margine imprimis basin versus crebre minute irregulariter eroso-denticulata, facie tenuiter sed prominenter reticulato-nervosa reticulo e maculis medianis rotundatis vel rhombicis isodiametricis marginalibusque valde elongatis composito; nervus medianus ceteris validior sed nunquam callifer. Consistentia valvarum maturarum papyraceo-membranacea, color carneo-bruneus, immaturarum flavescenti-viridis. Valvarum facies saepe minutissime impresso-punctulata. Nux matura atrobrunea, basi et apice fere aequaliter acuminata, ± 3 mm. longa, ± 2 mm. lata, in medio circiter latissima.

SYNONYMY: *R. densiflorus* Osterhout, Erythea 6: 13. 1898; Rydb. R. 231. 1922, excl. syn. *R. Bakeri* Greene.

WYOMING: North Park on edge of Wyoming (*Osterhout*, Ch, Wa; type). Centennial, Albany Co., banks of the river (*A. Nelson* 7711, Wa, Ke, La, Be; the two latter approach *R. pycnanthus* by the narrower valves). Big Creek Park, Hiltons Ranch (*Osterhout*, La). Medicine Bow Mts., Brooklyne Lake (*Mann* 170, La). Battle Lake (*A. Nelson* 4188, La). Battle, Carbon Co., continental divide, 3,000–3,300 meters (*Tweedy* 4392, Wa; no fr.). Rambler Ranger Station, Hayden Forest, Carbon Co., 2,700 meters (*Eggleston* 11307, Wa; no fr.). Copperton, 2,610 meters (*Tweedy* 4391, Wa; leaves shortly rounded or rather cordate at the base).

COLORADO: Region of Gunnison Watershed, Kebler Pass, 3,000 meters (*Baker* 797, Ca, NY, Ke, Be, De, Z, MW). Cameron Pass, 3,000 meters (*Baker*, NY; no fr.). Near Pagosa Peak, 3,000 meters (*Baker* 297, Be). Little Kate Basin, La Plata Mts., 3,450 meters, common in swales (*Baker, Earle & Tracy* 641, La, Wa, Be, Ke, MW;

no fr.). Bob Creek, La Plata Mts., 3,000 meters (*Baker, Earle & Tracy* 270, Be, MW). Semi-meadow flats, summit of North Park Range, Routt Co. (*Goodding* 1819, Wa, Ca, Be, Bo; no fr.). La Plata Mts., 3,150 meters (*Tweedy* 513, Wa). Near Breckenridge, Mt. Guyot, 1,275 meters (*Anderson*, SL). Breckenridge (*Brandegee* 257, Ca). Deadman Canyon (*Colo. Agr. Coll.* 3842, NY; approaching in habit *R. praecox*). Tolland (*Ramaley* 9396, La). Vicinity of Georgetown (*Patterson*, Ch). Rocky Mts. (*Hall & Harbour* 158, Ch; midrib of the valves somewhat thickish!).

The four species *R. densiflorus* Osterhout, *R. pycnanthus* Rech. f., *R. orthoneurus* Rech. f., and *R. praecox* Rydb. agree so closely as regards the rhizome, some leaf characters, the extremely well-branched panicle, and the form of the fruiting perigonium that they could possibly be referred to one collective species. At present I prefer to maintain them as different species because I have been able to study sufficient material of only one of them, *R. densiflorus*. Of the other species I have seen one or very few sheets, often from the same collection, so that I can not decide how far the differential characters are individual or specific. The rather abundant material of *R. densiflorus* that I have studied from different states is, unfortunately, fruiting in only a few cases. I must call attention to the fact that among the specimens referred here to *R. densiflorus* there are some which in different respects agree with the other species. There is, for example, among the numerous sheets of *Nelson* 7711 a specimen which differs from the others by narrower, more acute valves, and approaches in this character *R. pycnanthus*. Several specimens of *R. densiflorus*, as *Colo. Agr. Coll.* 3842 and *Tweedy* 4391, differ from the type by shorter stems, little-branched panicle, and obtuse, relatively broad basal leaves, and approach in these characters *R. praecox*. The specimens cited by Rydberg, besides the type (*Baker, Earle & Tracy* 270), differ from the type (*Rydberg & Vreeland* 6328) by the taller stem, more branched panicle, and longer, more pointed leaves, and thus approach *R. densiflorus;* both numbers are without ripe fruits. *Tweedy* 4392 (Hb. Washington) recalls *R. orthoneurus* in that the lateral nerves of the basal leaves form nearly a right angle with the costa.

For the present I can not pronounce definite judgment on the taxonomy of the *Densiflori*, but I will mention certain facts that seem to be important for phylogeny.

In the summer of 1933 I discovered in the Eastern Bertiscus (North Albanian Alps) a new *Rumex* and published it (Mag. Bot.

Lapok 33: 5. *pl. 1.* 1934; Repert. Sp. Nov. 38: 371. 1935) as *R. balcanicus.* This *Rumex* agrees so well with *R. densiflorus* that it would be, if found in the Rockies, considered perhaps only a variety of that species. The differences lie almost entirely in the outline of the leaves, especially in the lamina being decurrent far along the petiole. Also the occurrence of *R. balcanicus* along subalpine rivers or near springs close to the timber line corresponds exactly with the American species. The discovery of such a similar species in a country so far away makes it probable that the subsection *Densiflori* is an ancient group, formerly widespread, now persistent as a relic in some restricted places in the Balkan Peninsula, but in the Rocky Mountains still in full development, as shown by the variability.

Some species with grainless fruiting perigonia, as the *Aquatici* or *R. domesticus* Hartm., are in some respects very similar to the *Densiflori*, but I consider, not these, but *R. alpinus* L., to be the next related. *R. alpinus* has a creeping rhizome such as the *Densiflori* seem to have; the *Aquatici*, on the contrary, have vertical roots. As the subterranean parts are usually not at all or very fragmentarily represented in herbarium specimens, this subject needs further study. In case my suggestion finds confirmation, the relatively large, obtuse, and partly cordate leaves of *R. praecox*, too, would be considered as an analogy to *R. alpinus.*

Explanation of Figure 9, c.—Valves of *Rumex densiflorus* Osterh., 4 times natural size, from *Nelson* 7711, Wyoming.

28. **Rumex pycnanthus** Rech. f.

Perennis. Caulis erectus 1–2 m. altus, 1–2 cm. crassus, validissimus, inferne strictus superne flexuosus, rufescens, profunde sulcato-canaliculatus, basi residuis petiolorum ochrearumque imbricato-tunicatus, infra inflorescentiam non ramosus. Ochreae albido-brunnescentes hyalinae. Folia basalia magna ampla, ad 40 cm. longa, ad 15 cm. lata, oblongo-ovata vel oblongo-lanceolata, latitudine 2–2.5-plo longiora, lamina infra medium latissima, leviter undata vel fere plana, basi oblique truncata et in petiolum breviter protracta vel late oblique cuneata, apice saepius obtusiuscula, consistentia in vivo ut videtur subcarnosa, in sicco ± tenuiter papyracea. Nervi secundarii foliorum a primario angulo ca. 70°–80° abeuntes vix arçuati fere recti. Petiolus foliorum basalium laminae longitudinem subaequans vel superans. Folia caulina non numerosa oblongo-ovata leviter undata, basi rotundata, apice acuta latitudine 2–3-plo longiora, ut folia basalia utrinque glabra et levia, sub lente tantum

minutissime punctulata breviter petiolata; petiolus latitudine folii brevior. Panicula fructifera ampla densa foliis omnino carens; axis inflorescentiae plerumque valde flexuosa. Rami inflorescentiae semper fasciculati terni vel quini, e basi arcuata flexuosi vel stricte erecti vel subpatentes; internodia infima ramorum valde elongata, superiora abbreviata. Florum glomeruli multiflori foliis suffulcrantibus carentes, in statu fructifero infimi remoti, superiores contigui; inter pedicellos imprimis in glomerulis inferioribus hic illic ramulus brevis erectus vel ut pedicelli deflexus apice perigonia normalia proferens. Pedicelli fructiferi tenuiter filiformes prope basin (in quarta circiter parte inferiore) insensibiliter articulati, perigonio maturo (1.5) 2–3-plo longiora, in basin perigonii subalato-dilatati. Perigonii foliola exteriora anguste linearia acuta, 2.5–3.5 mm. longa, basibus interiorum appressa eorumque dimidiam latitudinem semper manifeste superantia. Perigonii folia interiora (valvae) in statu fructifero 5–6 mm. longa, 3–4 mm. lata, ambitu anguste ovato- vel oblongo-triangularia, basi truncata, apice acuta, margine basin versus breviter acute denticulata ± rarius subintegra, consistentia tenuiter membranacea, colore pallide olivaceo-bruneo vel flavescente, facie tenuiter nervosa nervatura e pinnata in reticulatam transiente. Nervus medianus ceteris validior sed nunquam callifer. Nux matura brunea 3–3.5 mm. longa, ± 2 mm. lata, superne longius, inferne brevius acuminata, paulo infra medium latissima.

SYNONYMY: *R. pycnanthus* Rech. f. Repert. Sp. Nov. 38: 372. 1935. *R. subalpinus* Jones, Proc. Calif. Acad. II. 5: 720. 1895; Rydb. R. 231. 1922; Tidestrom 160. 1925; non *R. subalpinus* (Schur) Simonkai, Enum. Fl. Transsilv. 472. 1886.

UTAH: Brigham Peak, Marysvale, 3,450 meters (*Jones* 5957, Ca, Bo, La; type of *R. subalpinus* Jones; leaves short, rounded or slightly cordate at the base). Near head of Bullion Creek, above Marysvale, 3,300 meters (*Jones* 5893ai, Wa; type; valves acute, sharply denticulate but relatively broad).

R. pycnanthus is very similar to *R. densiflorus* Osterh. It differs from the latter especially by the narrower, acute valves, distinctly denticulate toward the base. As for the rest, see under *R. densiflorus*. The original name had to be changed because of an older homonym.

29. **Rumex orthoneurus** Rech. f. Figure 19

Perennis. Caulis erectus, inferne strictus superne subflexuosus, ad 1 m. vel ultra altus, crasse fistulosus pallide bruneo-virescens,

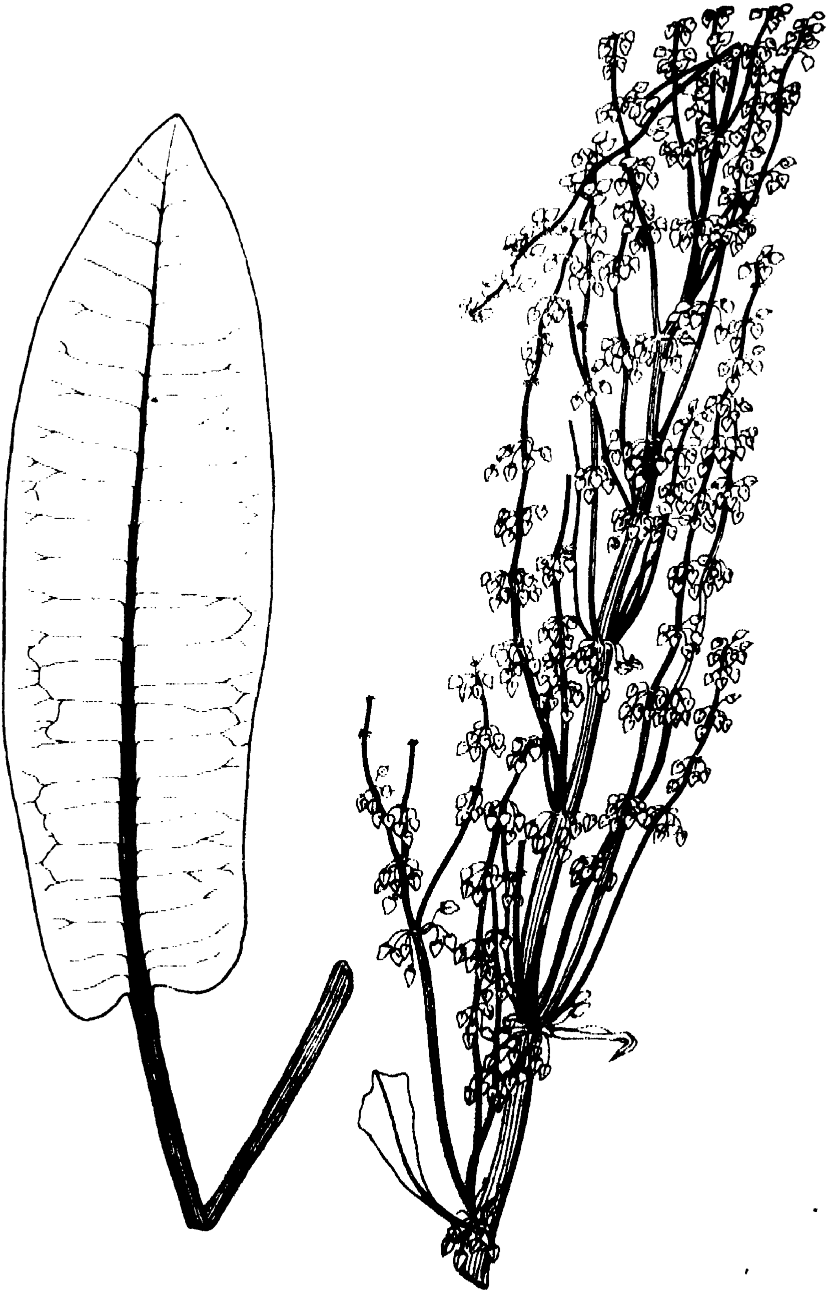


Fig. 19. *Rumex orthoneurus* Rech. f.

profunde sulcato-striatus, infra inflorescentiam non ramosus. Ochreae pallide bruneae evanescentes. Folia basalia (15–) 30–50 cm. longa, (4.5–) 9–14 cm. lata, plerumque plana, basi rotundata vel late cuneata, apice acuta, consistentia in vivo ut videtur carnosa, in sicco papyracea, lamina in medio circiter latissima latitudine plerumque 3.5–4-plo longior utrinque glaberrima laevis. Nervi secundarii foliorum recti, omnes fere angulo 90° a mediano abeuntes. Petiolus foliorum basalium crassiusculus laminam longitudine subaequans. Folia caulina inferiora et media basalibus similia sed sensim diminuta brevius petiolata, media infra medium latissima, superiora anguste lanceolata latitudine usque 6-plo longiora. Inflorescentia plerumque aphylla; rami inflorescentiae fasciculati terni usque quini subflexuosi erecti, inferiores elongati iterum ramosi, paniculam elongatam angustiusculam ± compactam formantes. Florum glomeruli multiflori, infimi tantum remoti, superiores approximati, omnes foliis suffulcrantibus carentes. Pedicelli fructiferi tenuiter filiformes in quarta circiter parte inferiora insensibiliter articulati, perigonio fructifero circiter 3-plo longiores. Perigonii foliola exteriora 1.5–1.7 mm. longa anguste lanceolata basibus interiorum appressa. Perigonii folia interiora (valvae) in statu fructifero 4 mm. longa et lata, ambitu rotundato-triangularia vel late ovato-rotundata, basi subtruncata vel late rotundata, apice acutiuscula vel obtusiuscula non producta, margine subintegra, facie indistinctius reticulato-nervosa; nervus medianus ceteris multo validior longitudinaliter incrassatus sed non callifer. Nux matura brunea, ca. 2.6 mm. longa, ca. 1.8 mm. lata, vix infra medium latissima.

SYNONYMY: *R. orthoneurus* Rech. f. Repert. Sp. Nov. 40: 294. 1936.

ARIZONA: Chiricahua Mts., Barfoot Park, rolling, andesitic pineland, recently lumbered, 2,400 meters (*Blumer* 1449, NY, Z, Ut, MW).

Rumex orthoneurus is very nearly related to *R. densiflorus* Osterh., from which it differs by the different proportion of fruits and pedicels, by the smaller fruiting perigonia with different outline, and by the nervation of the leaves. In *R. densiflorus* a longer, more robust secondary nerve alternates with a shorter and more slender one. In *R. orthoneurus* these differences are not so decided, so that the leaf seems to have double the number of lateral nerves. The lateral nerves form a right angle with the midrib. See also the discussion of *R. densiflorus*. This species is known from only one collection. Fragments of *R. orthoneurus* and *R. crispus* are mixed in all the sheets I have seen. The root fragments added in most of them do not seem to belong to *R. orthoneurus*.

Explanation of Figure 19.—Rumex orthoneurus Rech. f., half natural size; Arizona, *Blumer* 1449; basal leaf added.

30. **Rumex praecox** Rydb. Figure 20

Perennis; rhizoma crassum horizontale. Caulis erectus, 20–30 cm. altus, striato-sulcatus. Folia basalia ovata vel elliptica basi rotundata vel late cuneata, apice rotundata, parva, ad 6 cm. longa, 2.5–3 cm. lata, in sicco papyracea, glabra et levia, nervi secundarii angulo ca. 45° a primario abeuntes. Petioli foliorum basalium lamina 1.5–2-plo longiores. Folia caulina basalibus similia, sensim minora et praecipue multo brevius petiolata, omnia obtusa, superiora longitudine usque 3-plo longiora. Inflorescentia iam in primo nodo supra basin incipiens, subelongata, angusta, laxiuscula. Florum glomeruli inferiores remoti, superiores approximati, omnes aphylli. Pedicelli filiformes, infra medium indistincte articulati. Perigonii foliola exteriora 2–3 mm. longa, ovata. Perigonii folia interiora (valvae) in statu immaturo ad 5 mm. longa, ovata, integra, ecallosa. Nux submatura ad 3 mm. longa.

SYNONYMY: *R. praecox* Rydb. Bull. Torrey Club 33: 137. 1906; Rydb. R. 231. 1922.

COLORADO: Grayback Mining Camp (*Rydberg & Vreeland* 6328, NY; type).

The second specimen cited by Rydberg differs considerably in vegetative characters, so that I place it under *R. densiflorus*. For relationship with other species, see the discussion of *R. densiflorus* Osterh.

Explanation of Figure 20.—Rumex praecox Rydb., half natural size; *Rydberg & Vreeland* 6328, type.

31. **Rumex alpinus** L.

Rootstock creeping; stems thick, upright; fruiting panicle much branched, compact; basal leaves large, usually only 1–1.5 times as long as broad, broadly rounded at the apex, deeply and broadly cordate at the base; pedicels filiform, about 3 times longer than the fruit, jointed below the middle; valves ovate, 4–6 mm. long, 4–5 mm. broad, cordate at the base, acute, without any callosity.

SYNONYMY: L. Sp. Pl. 334. 1753; Fernald, Rhodora 23: 107. 1921.

Originally from the mountains of Europe and Western Asia. Found only once, as introduced, in America.

NOVA SCOTIA: Yarmouth Co., springy fields and swales, Rockville (*Fernald & Long* 21052, O).

32. **Rumex domesticus** Hartm.

Perennial; stems strict, upright; basal leaves oblong-ovate or broadly lanceolate, narrowed or rounded at the base, more or less crisped; fruiting panicle compact; pedicels to 2.5 times as long as the fruit, jointed below the middle; valves reniform-rounded, deeply cordate, entire or nearly so, all without a grain or rarely one of them with a very small, globular suggestion of a callosity.

SYNONYMY: Hartm. Scand. Fl. ed. 1. 148. 1820; Murbeck, Bot. Notiser 1899: 13. 1899.

NEWFOUNDLAND: Torbay, moist place in pasture (*C. D. Howe* 1283a, Lu). Irishtown, Bay of Islands (*Waghorne*, Z).

NEW BRUNSWICK: St. Andrews (*Fowler*, Wa).

NOVA SCOTIA: Louisburg, Cape Breton Isl. (*Macoun* 20215, O). Barrington Passage (*Macoun*, O). Ball's Island (*Macoun* 83946, O). About houses and in fields, Boylston (*Hamilton* 26675, O).

ALASKA: Juneau (*Hultén* 8291, Lu; *Anderson* 430, NY). Karluk, common in bogs and brooks (*Horne*, NY; uncertain, leaves only). Unalaska (*Hultén* 7532a, Lu). Umnak Isl., Nikolski (*Hultén* 7110, Lu; uncertain, leaves only).

MAINE: South Bristol (*Wilson*, NY).

WISCONSIN: Madison (*Shaw School*, Ko; *Trelease*, Lu).

This species has its principal area in the north of Europe, but it occurs also in an apparently spontaneous state in the eastern Pyrenees. I saw one specimen from high Asia and one from eastern Asia, which may belong to the same or a very nearly related species. American specimens mentioned below are in no way different from the North-European. American botanists should try to discover whether this species is indigenous in the New World. Its distribution in North America—Eastern Canada and Alaska with adjacent islands—suggests that it may be so. The Wisconsin specimen may be introduced in any case. Compare the discussion of *R. pallidus* and *R. fenestratus*.

33. **Rumex occidentalis** Wats. Figure 9, *d*

Perennis. Caulis stricte erectus, humilis vel elatus, gracilis vel validus, internodiis inferioribus et mediis plerumque elongatis, tenuiter sulcato-striatus, rufescens vel purpureo-suffusus, 50–150 cm. altus, infra inflorescentiam non ramosus. Ochreae pallide bruneae tenuiter membranaceae cito evanescentes. Folia basalia e basi ± profunde cordata oblongo- vel ovato-triangularia apice acuta

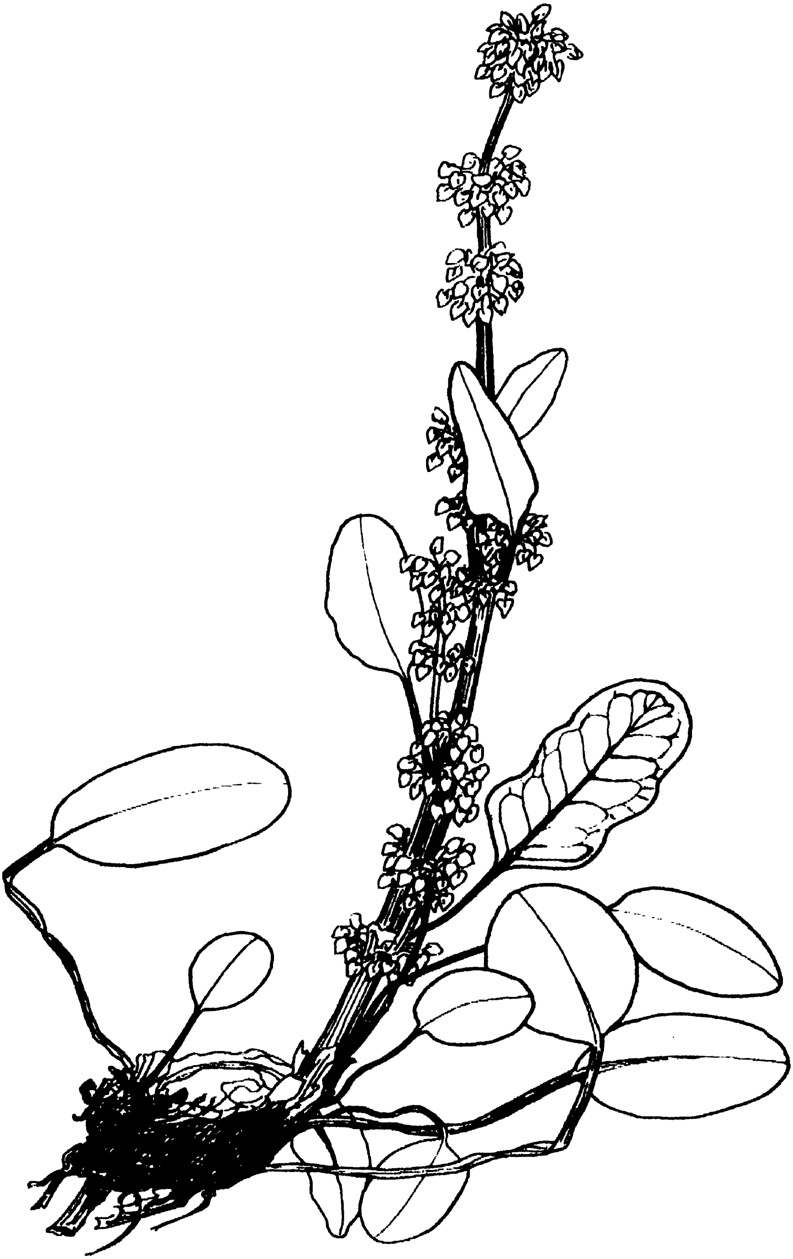


Fig. 20. *Rumex praecox* Rydb.

vel obtusiuscula, plana vel leviter undata, parva vel ampla, latitudine 2–2.5-plo longiora, in quarta circiter parte inferiore latissima, consistentia in sicco ± tenuiter papyraceo-membranacea, utrinque glabra et levia. Nervi secundarii a mediano angulo ca. 45°–60° abeuntes, arcuati. Petiolus foliorum basalium lamina ca. quarta vel tertia parte brevior vel eam subaequans. Folia caulina e basi profunde cordata oblongo-triangularia, latitudine ca. 2–5-plo longiora, ± undata, apice acuta prope basin latissima, brevius petiolata ut folia basalia glabra et levia, sub lente tantum minutissime punctulata. Rami inflorescentiae arcuati vel ± stricte erecti, breves, singuli vel infimi paulum elongati bini ternive, inflorescentiam ± angustam fructificationis tempore compactam strictam elongatam, rarius abbreviatam subaphyllam formantes. Florum glomeruli multiflori, foliis suffulcrantibus carentes, omnes approximati, in statu fructifero contigui. Perigoniorum fructiferorum pedicelli tenuiter filiformes, in quarta vel quinta parte inferiore insensibiliter articulati, in basin perigonii breviter infundibuliformi-dilatati, perigonio fructifero 1.5–2-plo longiores. Perigonii foliola exteriora lineari-lanceolata, ca. 2 mm. longa, basibus interiorum accumbentia. Perigonii folia interiora (valvae) in statu maturo 4–5 mm. longa, 5–6 mm. lata, ambitu cordato- vel rotundato-triangularia, basi late leviterque emarginata vel fere truncata, apice acuta non vel vix producta, margine subintegra vel saepius minutissime irregulariterque eroso- vel crenulato-denticulata, colore fusco-bruneo-rufescente, consistentia tenuiter membranacea. Valvae semper omnino ecallosae, facie tenuiter elevate reticulato-nervosae, reticulo subaequali, maculis omnibus elliptico- vel rotundato-rhombicis, marginalibus subminoribus, non vel vix elongatis; nervus medianus ceteris validior. Nux matura atrofusca, 3 mm. longa ± 1.5 mm. lata, apice sublongius, basi brevius acuminata, paulo infra medium latissima.

SYNONYMY: *R. aquaticus* Pursh 248. 1816, non L.; Campdera 101. 1819, p.p.; Meisn. apud DC. 43. 1856, p.p. *R. domesticus* Hook. 129. 1840, p.p. excl. *β nanus*, non Hartm. *R. occidentalis* Wats. Proc. Amer. Acad. 12: 253. 1877; Wats. 8. 1880; Coult. 317. 1885; Macoun 415. 1883; Trelease 81. 1892; Britt. & Brown 550. 1896; Piper 225. 1906; Gray 355. 1908; Woot. & Standl. 192. 1915; Rydb. R. 231. 1922; Jepson 292. 1922; Tidestrom 160. 1925; Rydb. P. 279. 1932. *R. polyrhizus* Greene, Pittonia 4: 305. 1901. *R. Bakeri* Greene, Pl. Baker. 3: 15. 1901. *R. gracilipes* Greene, Pittonia 4: 304. 1899–1901. (?)*R. elongatus* Gray 355. 1908, non Guss. (?)*R. longifolius* Meisn. apud DC. 44. 1856, non DC.

ILLUSTRATIONS: Trelease 1892, *pl. 19;* Britt. & Brown 550. 1895.

DISTRIBUTION: Nearly all Canada and western United States.

QUEBEC: Swamps, Salt Lake, Anticosti (*Macoun* 23728, O).

LABRADOR: Saguenay Co., shore of bay, Petite Rivière Coxipi Bronague (*H. St. John* 90398, O; no fr.).

ONTARIO: Twenty-five miles north of Ft. Albany, James Bay (*Wilson* 53963, O; no fr.). Lake Nipigon, low ground 50° N. (*Macoun* 23732, O: approaching *R. arcticus* in habit and form of leaves).

MANITOBA: In a boggy place, southwest of Brandon (*Macoun* 12847, O). Swamps and boggy meadows, Lake Winnipegosis, ca. 52° N. (*Macoun* 23731, O; slender, not ramified). Winnipeg Valley (*Bourgeau,* Be). Fort Churchill, Hudson Bay (*R. Ball* 23721, O; in habit near *R. arcticus,* but base of leaves cordate). Churchill (*Macoun* 79396, O; no fr.; possibly *R. fenestratus;* poor ramification).

SASKATCHEWAN: Saskatchewan Plains (*Macoun* 1272, Ke; like *Macoun* 23731 and 23721). Low ground, Moose Mt. Lake (*Macoun* 23733, O; no fr.). Low ground, Cypress Hills (*Macoun* 23725, O). Near Manitou Lake, along line of Grand Trunk Pac. Railway (*Macoun & Herriot* 76819, O). Les Coulées, abundant (*Bourgeau,* Ke; valves larger, more triangular).

ALBERTA: Vicinity of Banff, wet ground along Bow River, 1,350 meters (*McCalla* 2398, Ke; leaves narrow, not cordate). Wet, boggy places, Sand Hills (*Macoun* 23724, O). Wet places along . . . Cardston(?) (*Macoun* 12911, O; valves larger, more triangular). Rocky Mts., low ground, Kicking Horse Lake (*Macoun* 23729, O). Headwaters of Saskatchewan and Athabasca rivers (*S. Brown* 1528, NY; mixed with *R. paucifolius*). Marshes near Sulphur Spring, Crow Nest Pass (*Macoun* 24673, O; poor ramification, habit of *R. domesticus*).

BRITISH COLUMBIA: (*Rothrock* 62, Ch). Vicinity of Sidney (*Macoun* 87955, O; perhaps *R. occidentalis* × *fenestratus?;* valves different in size; nutlets sterile).

YUKON: Second island in Klondike River (*Macoun* 91294, O; approaching *R. fenestratus*).

ARCTIC NORTH AMERICA: Franklin Exped. (*Richardson* 23727, O).

NORTH DAKOTA: Butte, Benson Co., in ravine (*Lunell,* Wa, La).

SOUTH DAKOTA: Spearfish Canyon, stream side, with *Quercus, Salix, Populus* (*Hayward,* NY). Bank of Little Spearfish Creek (*Murdoch,* Ch).

MONTANA: Sedan, Gallatin Co., east of Flathead (*W. W. Jones*, Ca). Swampy ground near Bozeman, 1,350 meters (*Blankinship* 454, Wa, Ch, Be, St). Along Swiftcurrent Creek, below Lake McDermot, 1,350 meters, boggy meadow (*Standley* 16875, Wa). Vicinity of St. Mary Chalets, foot of St. Mary Lake, 1,350 meters, wet thicket (*Standley* 17391, Wa). Davaher Ranch, Flathead National Forest (*Kirkwood* 2396, Ca; stem short, little ramified; thick, leathery basal leaves, the nerves of the upper surface immersed). Billings (*C. M. Patten*, Ch).

WYOMING: Yellowstone Park, Swan Lake Flat (*Mearns* 293, Wa). Gibbon Canyon, wet ground (*A. & E. Nelson* 6751, Wa). Yellowstone Park (*Mearns* 3018, Wa). Tower Fall Ranger Station, 1,860 meters (*Conard*, St). Teton Forest, 2,400 meters (*Tweedy* 472, NY). Sherman (*Greene*, photo. in hb. MW; type of *R. polyrhizus* Greene). Big Horn Mts., headwaters of Clear Creek and Crazy Woman River (*Tweedy* 3272, P). Jaw Bone Gulch (*Nelson*, La; by larger valves approaching *R. fenestratus*).

COLORADO: Gunnison, 2,300 meters (*C. F. Baker* 903, Wa, Ca, La, SL, NY, Ke, MW; type of *R. Bakeri* Greene). Gunnison (*Shear* 5073, Wa). Mountain View, 2,900 meters (*Clements* 395, La, Ko; mixed with *R. fenestratus;* Wa, Be). Without locality (*Engelmann*, Be). Fort Collins, 1,500 meters (*Towson*, La). Vicinity of Georgetown, banks of Clear Creek (*Patterson*, Ch).

NEW MEXICO: Fort Wingate (*Matthews*, Be). Mogollon Mountains, Socorro Co., Middle Fork of the Gila (*Wooton*, Wa). Vicinity of Brazos Canyon, Rio Arriba Co., swamp (*Standley & Bollman* 11026, Wa). Weleber's Cattle Camp, Rio Fernandez de Taos Canyon, Carson Forest, Taos Co., 2,700 meters (*Eggleston* 19279, NY).

TEXAS: Dallas (*J. Ball*, De; strange habit, stem very tall and stout, upper leaves long and crisped).

IDAHO: About Forest, Nez Perce Co., 1,050 meters (Heller 2481, Z; approaching *R. fenestratus*).

UTAH: Fish Lake, 2,700 meters (*Jones* 5784, Wa, Ca). Fish Lake, around Twin Creeks (*Rydberg & Carlton* 7493?, Wa). Rabbit Valley, 2,040 meters (*L. F. Ward* 411, Wa).

WASHINGTON: Rock Island, Kittitas Co., 1,850 meters (*Sandberg & Leiberg* 447, Be, approaching *R. fenestratus;* Le).

OREGON: River bottoms (*Howell*, Be, Bu; approaching *R. fenestratus*). Near Crow Creek, Wallowa Co. (*Sheldon* 8497, Wa; perhaps *R. fenestratus*).

NEVADA: Pine Creek, High Ranch (*Greene*, photo. MW; type of *R. gracilipes* Greene). Toiyabe Forest, 1,800–2,400 meters, Big Creek, Kingston Canyon, meadow (*Hitchcock* 817, Wa).

CALIFORNIA: Goose Lake (*R. M. Austin* 419, Wa). Santa Barbara (*Elmer* 3932, MW). Fall River Lake, Shasta Co. (*Baker*, Ca; approaching *R. fenestratus*). Mt. Shasta, Siskiyou Co., meadow at Sisson, 1,050 meters (*Hall & Babcock* 4065, Ca).

LOCALITY INDEFINITE: Rocky Mts., Lat. 39°–41° (*Hall & Harbour* 499, De, Bo; leaves small, scarcely cordate, panicle rather sparsely branched).

Rumex occidentalis is highly variable as regards the size, thickness of stem, ramification of inflorescence, and, especially, form of leaves. Also the size and outline of the valves and the size of the nutlets are variable. The demarcation of this species and the question whether it is a unit or whether certain combinations of characters may be selected as indicating separate types must be closely examined.

Species of *Lapathum* with perennial, vertical roots, without axillary branches, with leaves cordate at the base, and with grainless, entire valves (subsect. *Aquatici*) are rather closely dispersed over the temperate zone of the northern hemisphere so far as the considerable need for humidity of this group of species is fulfilled. As in this group neither grains nor dentation of the border of the valves ever develop, it is clear that all these forms have a homogeneous stamp as to the formation of the fruits, in contrast to the variability of the vegetative organs. This unity goes so far that the inclusion of all these forms in one collective species could be defended. This collective species would have to bear the name *Rumex aquaticus* L. as the oldest, in an extended sense. Actually the older authors as, for instance, Pursh, Campdera, and Meisner, did not detect a difference between the Old World and the New World representatives of the *Aquatici*, but these authors had not well defined their *Rumex aquaticus* and had included a lot of elements belonging to other groups of species. This uncertainty arises concerning the North American *Aquatici* by the appearance in the older American literature of representatives of *Aquatici* at the same time under the names of *R. aquaticus*, *R. domesticus*, and *R. longifolius*. Watson is the first who makes a separating line between the representatives of the Old and the New World *Aquatici* by creating his *R. occidentalis*.

The extraordinary variability of *R. occidentalis* was not considered by Trelease in the first synoptical account of the American *Rumex* species, but he recognized the close relationship of *R. arcticus* to *R. occidentalis* by placing Hooker's *R. domesticus* var. *nanus* near *R. occidentalis.* It was reserved to Greene to describe six further species of the relationship of *R. occidentalis.* If in this work only two of them appear and that in an altered sense (*R. fenestratus* and *R. fenestratus* var. *procerus*), it does not detract from that author's sharp power of observation, but only emphasizes the lack of critical weighing, which is occasionally to be found in his works.

My present attempt at interpretation of the American *Aquatici* is based on the following observations. The widest range is occupied by forms with an average length and breadth of the valves of 5 mm.; that is, from New England in the east to Montana (and occasionally still farther) in the west and in the Rocky Mountains south to New Mexico. In the west this area is joined by a zone exclusively or at least prevailingly inhabited by forms with large fruits, the valves averaging 9 mm. in size. The distribution of these large-fruited forms is from western middle California in the south to Alaska in the north, with especially abundant occurrence in the northwestern United States and southwestern Canada (Vancouver Island). There are wide interruptions in the ranges of these forms in northwestern Canada.

In a surprising way, forms with large fruits appear also on the easternmost edge (Labrador) of the continent, differing only slightly from the western by a more triangular-acute form of the valves. This fact deserves special consideration in a phytogeographic respect, since it shows analogies in other subsections: among the *Salicifolii* the appearance of the east-American *R. pallidus* Bigel. in Alaska; among the *Maritimi*, the appearance of the likewise east-American *R. persicarioides* L. sensu St. John in California and Oregon; further the appearance of *R. domesticus* Hartm. in eastern Canada and Alaska, but whether it is wholly indigenous, it must be admitted, is open to question. I unite the *Aquatici* with small fruits under the name *R. occidentalis*, without regard to whether they have tall or low, stout or slender, little- or much-branched stems, long or short, broad or narrow, distinctly or not distinctly (or occasionally not at all) cordate leaves, and long or short petioles, since all these characters apparently neither parallel each other nor are limited to certain regions, but in a high degree depend on such circumstances as humidity, elevation above sea level, etc.

With increasing elevation above sea level the stem becomes usually more delicate, lower, and less branched, just as in more northern countries. At the same time the leaves become narrower and less distinctly cordate. This last modification seems to appear also when humidity is considerable.

In some cases it is not easy to distinguish *R. arcticus* from forms of *R. occidentalis* of extreme situations. *R. arcticus* is distinguished from these by small leaves which have a thick consistency, by a succulent and more flexuous stem, by thick and not very distinct nerves of the valves, and by an often very intense red color of the whole plant, even when the base of the leaves of *R. arcticus* is occasionally a little cordate.

The forms with large fruits I unite under the name *R. fenestratus* Greene (originally described from Vancouver Island). *R. confinis* Greene from Idaho I must reduce to synonymy. *R. procerus* Greene I add as a variety to *R. fenestratus;* it occupies the most southern stations that lie remarkably low for these latitudes, and is characterized by an especially tall and robust habit. I have had to create a new name for the Labrador plant mentioned before, with large fruits and acute valves, and call it *R. fenestratus* var. *labradoricus.* The other species of *Aquatici* created by Greene I have reduced to synonymy under *R. occidentalis.*

Explanation of Figure 9, d. Valves of *Rumex occidentalis* Wats., 4 times natural size, Winnipeg Valley, *Bourgeau.*

34. **Rumex arcticus** Trautv. Figure 21

Radix perennis crassa. Basis caulis rudimentis emarcidis petiolorum et ochrearum imbricato-tunicata. Caulis humilis simplex—inflorescentia tantum interdum breviter pauciramosa—stricte erectus vel subflexuosus, paucifolius, 10–40 cm. altus, crebre tenuiter sulcato-striatus, saepe purpureo-suffusus. Ochreae bruneae evanescentes. Folia basalia parva ca. 6–12 cm. longa, 2–3 cm. lata, utrinque ut tota planta omnino glabra et levia, in vivo ut videtur carnosa, in sicco coriacea vel crasse membranacea, plana vel leviter undata, margine saepe crispata, ambitu ovato-lanceolata vel oblongo-lanceolata, basi leviter cordata vel truncata vel ± late cuneata, saepe paulo obliqua, apice obtusiuscula vel acuta, longitudine 3–5-plo longiora, infra medium latissima. Nervi laterales foliorum saepe vix conspicui, angulo valde variabili (ca. 40° usque fere 90°) a mediano abeuntes. Petiolus foliorum basalium lamina plerumque ⅛–½ brevior, rarius eam subaequans. Folia caulina inferiora basalibus subsimilia sed

proportione minora angustiora brevius petiolata; folia caulina superiora saepe anguste lineari-lanceolata, latitudine 6–8-plo longiora. Rami inflorescentiae—si evoluti—tenues breves arcuato-divergentes flexuosi, paniculam parvam laxiusculam foliis omnino fere carentem formantes. Florum glomeruli saepe depauperati, rarius multiflori, in statu florendi ± approximati, in statu fructifero ± remoti. Pedicelli fructiferi filiformes, in tertia vel quarta parte inferiore insensibiliter articulati, basin perigonii versus sensim subalato-dilatati, perigonio maturo ca. 1–2-plo longiores. Perigonii foliola exteriora basi late connata, ovato-lanceolata, obtusiuscula vel subacuta, 1.5–2 mm. longa, basibus interiorum arcte appressa. Perigonii folia interiora (valvae) in statu fructifero ca. 4–5 mm. longa, 3–4 mm. lata, ambitu ovata, consistentia tenuiuscule membranacea, colore brunea vel purpureo-suffusa, basi rotundata apice obtusa vel acutiuscula, margine subintegra, facie tenuiter et subaequaliter reticulato-nervosa, nervo mediano ceteris validiore sed minime quidem callifero. Nux matura atrobrunea ca. 2 mm. longa, ca. 1.3 mm. lata, basi breviter, apice longius acuminata, infra medium latissima.

SYNONYMY: *R. arcticus* Trautv. in Middendorff, Reise Sibir. 1, pt. 2: 29. 1856; Murbeck, Bot. Notiser 234: 1917; Hultén, Fl. Kamtchatka in Svensk. Vet. Akad. Handl. III. 5, No. 2: 45. 1928. *R. domesticus β nanus* Hook. 129. 1840. *R. occidentalis* var. *nanus* Trelease 82. 1892. *R. longifolius β nanus* Meisn. apud DC. 44. 1856.

DISTRIBUTION: Arctic-circumpolar.

CANADA: Yukon, Gold River Creek (*Macoun* 91292, NY). Gold Run Creek (*Macoun* 91292, O). South coast of Coronation Gulf, Tree River (*Cox & O'Neill* 416, O). Mouth of Mackenzie River, shore of Mackenzie Bay (*Stringer* 15953, O; branched; leaves truncate at base). King Point, 69° 7′ N. Lat., 137° 40′ W. Long. (*G. Jansen*, Ko). Bathurst Inlet, 67°–68° N. Lat., 109°–111° W. Long. Arctic Sound (*E. M. Anderson* 468, 469, O). Herschell Isl., Yukon, 69° 35′ N. Lat., 139° W. Long. (*F. Johansen* 229, Ko, O; panicles branched).

ALASKA: Yukon District (*F. Anderson*, St). Vicinity of Norton Sound, north of Nome (*Rhodes*, Ca; not branched; stem 60 cm. high; most leaves suddenly narrowed). Port Clarence (*Kjellman*, St). St. Michael (*Setchell*, Ca). Shishmaref Inlet, near Kotzebue Sound (*Chamisso*, Be). Survey Camp No. 1, Kotzebue (*W. E. B.*, Ca). Nome (*Piper*, P; *Blaisdell*, Ca). McKinley National Park, head of Savage River, narrow valley between high mountains, along stream-overflowed islet, 1,000 meters (*Ynes Mexia* 2048, Ca; lower leaves broad and short but not cordate). McKinley National Park near

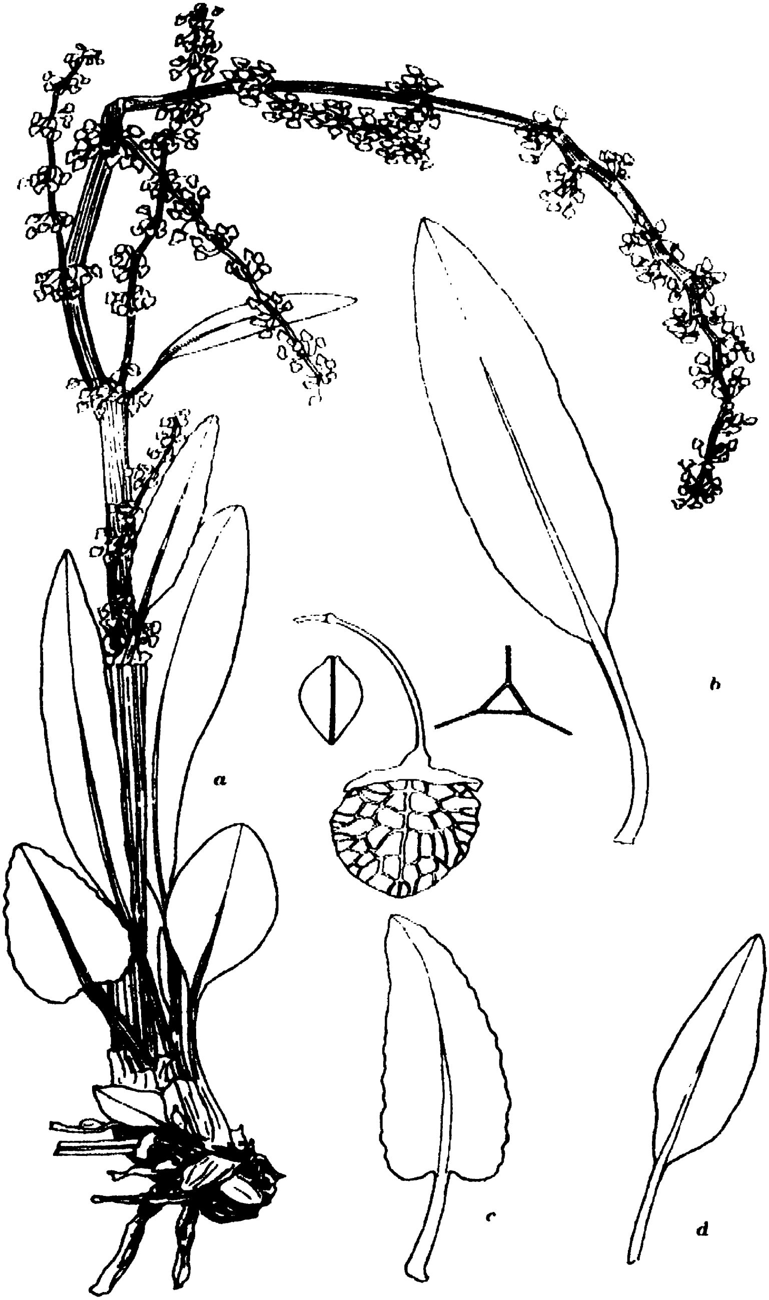


FIG. 21. *Rumex arcticus* Trautv.

center of north boundary, 700 meters, slopes west of Wonder Park (*Mexia* 2244, Ca, St; little-branched). St. Lawrence Island (*Kjellman*, St). Nunivak Island, damp ground (*Macoun* 24490, O). Kussiloff (*Evans* 694, Wa; stem to 70 cm. high; panicle branched).

LOCALITY UNCERTAIN: "Northwest America" (*Seemann* 1798, Ke).

Rumex arcticus is characterized by its short, somewhat stout or succulent stem, almost simple inflorescence (rarely with a few short, slender and flexuous branches), and small, somewhat thick basal leaves, almost cuneate at the base. The whole plant, or at least the stem and fruits, is often purple. Specimens doubtful in one or another respect, showing not all the characters together, are known from Canada and Alaska. Since the material available is poor and mostly incomplete, I can not decide whether these specimens should be considered as connecting forms between *R. occidentalis* and *R. arcticus* at the limit of their areas or as hybrids. The geographic distribution of this species is arctic-circumpolar, the only example of this type of distribution in the subgenus *Lapathum*.

Explanation of Figure 21.—*Rumex arcticus* Trautv., half natural size: (*a*) habit, Alaska, *Mexia* 2048; (*b*) basal leaf, Canada, *Anderson* 468; (*c*) basal leaf, Canada, *Stringer* 15953; (*d*) basal leaf, Canada, *Cox & O'Neill* 416. Valves 4 times natural size, from *Stringer* 15935.

35. **Rumex fenestratus** Greene. Figure 22, *a*

Perennis. Caulis stricte erectus saepe valde elatus interdum plusquam 2 m. altus pallide roseo-flavescens (color rhei), sulcato-striatus, inflorescentia excepta non ramosus. Ochreae pallidae hyalinae cito evanescentes. Folia basalia in sicco tenuiter vel crasse papyraceomembranacea, magna (ex auctore ad 15 cm. lata) latitudine ca. 2-plo longiora, supra basin latissima, basi profunde cordata, apice acuta vel acutiuscula, ambitu ovato- vel oblongo-ovato-triangularia, leviter vel valde undato-crispata vel fere plana, subtus imprimis ad nervos cum petiolis saepe papilloso-scabra; nervi secundarii a mediano angulo ca. 70°–90° abeuntes, demum prorsus curvati. Petioli foliorum basalium laminae longitudinem fere aequantes. Folia caulina e basi profunde cordata oblongo-triangularia, apice acuta, latitudine plerumque plusquam triplo longiora, supra basin latissima, leviter undata, breviter petiolata, levia, sub lente tantum minute papilloso-punctulata. Panicula ampla densiuscula; axis inflorescentiae saepe ± flexuosa; rami singuli rarius bini ternive, inferiores partim iterum ramosi ± elongati, superiores breves simplices vel breviter ramosi, omnes tenues subflexuosi, erecto-patentes vel leviter arcuati. Florum

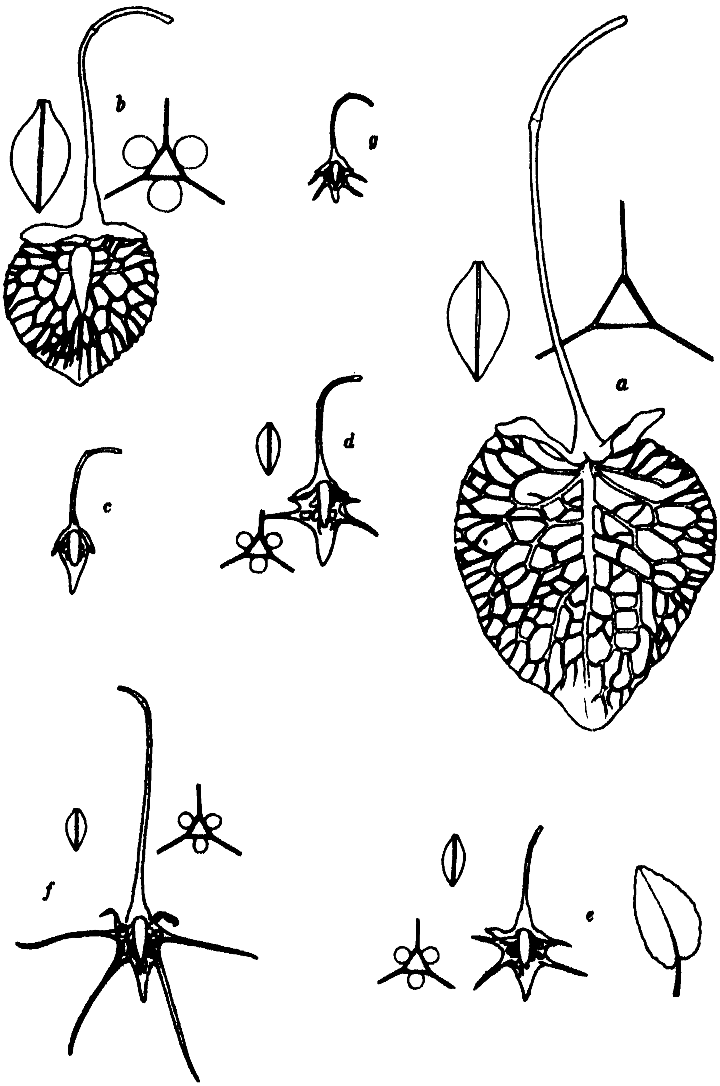


Fig. 22. Valves of (a) *Rumex fenestratus* Greene, (b) *R. Britannica* L., (c) *R. fueginus* var. *athrix* (St. John) Rech. f., (d) *R. fueginus* var. *brachythrix* Rech. f., (e) *R. fueginus* var. *ovato-cordatus* Rech. f., (f) *R. fueginus* var. *tanythrix* Rech. f., (g) *R. fueginus* form.

glomeruli multiflori, foliis suffulcrantibus carentes, in statu fructifero contigui, perigoniorum fructiferorum pedicelli tenuiter filiformes, perigonio maturo ± 1.5-plo longiores, in tertia vel quarta parte inferiore insensibiliter articulati, in basin perigonii breviter infundibuliformi-dilatati. Perigonii foliola exteriora anguste lineari-lanceolata, ca. 3 mm. longa, emarginationi interiorum accumbentia. Perigonii folia interiora (valvae) in statu fructifero 10 mm. longa, 7–9 mm. lata, ambitu rotundato-cordata basi ± profunde emarginata, apice acutiuscula vel rotundato-acuminata, nunquam producta, margine subintegra vel saepius—imprimis basin versus—minutissime irregulariterque erosulo-denticulata, colore pallide carneo-bruneo, consistentia tenuiter membranacea. Valvae semper omnino ecallosae, facie tenuiter elevate reticulato-nervosae, reticulo aequali maculis marginalibus minoribus non vel vix elongatis; nervus medianus ceteris validior. Nux (non perfecte matura) fusca 3.5–4 mm. longa, ca. 2 mm. lata, utrinque fere aequaliter acuminata, paulo infra medium latissima.

SYNONYMY: *R. fenestratus* Greene, Pittonia 4: 306. 1901. *R. confinis* Greene, Pittonia 4: 306. 1901; Rydb. R. 231. 1922, non Hausskn. Mitt. Geogr. Ges. Thuer. 3: 77. 1885. *R. occidentalis* auctorum amer. bor. occid. p.p.

DISTRIBUTION: Alaska to northwestern United States and northeastern Canada.

LABRADOR: (Var. *labr.*). Straits of Belle Isle, marshy belt behind the strand, Blanc Sablon (*Fernald & Wiegand* 3288, O, Ke).

QUEBEC: (Var. *labr.*). Ile d'Anticosti, Lac Salé, dans la prairie naturelle (*Marie-Victorin & Rolland-Germain* 27339, 27151, St). Garden at Ceravalla Bay, Lake Melville, common (*Wetmore* 102933; no ripe fr.). Shores of Naskanpi River, Grand Lake, Lake Melville Distr., common (*Wetmore* 102934, O; no ripe fr.).

BRITISH COLUMBIA: Swampy places, Agossing (*Macoun* 23726, O). Swampy places, Sproat(?) (*Macoun* 23730, O). Dead Man's River (*Anderson,* P). Without locality (*Rothrock* 62, NY). Vancouver Island, Sidney (*Macoun* 83944, O). Vicinity of Nanaimo (*Macoun* 83942 Ch, O, Be). Colginty River (*Macoun* 83943, O). Salt marshes, Chase River near Nanaimo (*Macoun,* O). Vicinity of Ucleulet (*Macoun* 83941, O). Salt marshes, Comax (*Macoun* 1570, O; type).

ALASKA: Rodman Bay, Baranoff (*Stephans* 106, Ca). Open places, shores of Behm Canal (*Gorman,* Ca). Juneau, near beach (*J. P. Anderson* 2A-215, Lu). King Cove (*Eyerdam* 1735, Lu; no ripe fr.).

River bottom, Kelp Bay, Baranoff Isl. (*Walker* 795, Ca, St; no ripe fr.). Matanuska, wet roadside (*Anderson* 891, MW; 1040, Lu; no ripe fr.). Vicinity of Karluk, Kodiak Isl. (*Rutter* 75, St, Ko; no ripe fr.). Kodiak, Sitkalidak Isl., Port Hobron (*Eyerdam* 189, Lu). Jakobi Island (*Anderson* 1358, Ch). Unalaska (*Eyerdam* 2486, 2450, Lu; *Hultén* 7654, Lu). Makuslin Bay, Unalaska, along stream (*E. C. van Dyke* 183, G; no ripe fr.). Unimak Isl., False Pass (*Eyerdam* 2222, 2233, Lu; no ripe fr.). Akutan (*Norberg* 429, Lu; no ripe fr.). Umnak Isl., Nikolski (*Hultén* 7110, Lu; no ripe fr.). Amlia Isl. (*Eyerdam* 1187, Lu; leaves only). Attu (*Hultén* 6122, Lu; leaves only).

MONTANA: Ronan, 900 meters, Middle Temperature Life Zone (*M. E. Jones*, G; no fr.). Libby Creek (*Blankinship*, SL).

IDAHO: Corral, Camas Prairie, thicket edge, 1,710 meters (*Macbride & Payson* 3812, NY, Wa, Ca, UW). Wet meadows around Lake Pend d'Oreille (*Leiberg* 562, SL, Lu; type of *R. confinis* Greene). Bitter Root (*Sandberg*, Ch). Coopers(?) (*A. I. Mulford*, SL). Moist and wet places along Paradise Creek, common (*Henderson*, Wa). Moscow, Latah Co. (*Abrams* 728, Ca; no fr.). Common in wet copses, valley of Big Potlatch River, Nez Perce Co. (*Sandberg, etc.* 364, Ke). Common along Green Horn Creek near Hailey (*Tidestrom* 2753, Wa; no fr.).

WASHINGTON: Kittitas Co., 185 meters (*Sandberg & Leiberg* 447, Ca). Rock Island, Kittitas Co. (*Sandberg & Leiberg* 447, P, Wa). Loon Lake, Stevens Co. (*Turesson*, Lu; no fr.). Yakima Region, Triton(?) Basin (*Brandegee*, Ca). Seattle (*Piper*, Ch, MW; *Mosier*, Wa). Hoquiam (*E. M. Bardell*, SL; no fr.). Edge of lake near Evergreen trail, Quiniault (*Conard* 226, P, Wa). Western Klickitat Co., bottom lands, Columbia River (*Suksdorf* 1401, P, Ch, Ca). Hoquiam (*Cowles* 543, Ch). Base of Mt. Carleton (*Kreager* 300, P). Cattle Point, San Juan Islands (*Peck* 12719, P). Wilson Creek (*Lake & Hull*, P). Rock Lake, Whitman Co. (*Weitman* 154, P). Pullman (*Piper* 1548, P).

OREGON: Portland (*Henderson*, P). Portland, Lower Albina (*Sheldon* P, Ch, Wa). Wet meadow on Red Blanket Creek, near Prospect, 1,050 meters (*Applegate* 2552, Wa; no fr.). Ross Slough, Coos Co. (*H. H. Smith* 3680, Ca; no fr.). Vicinity of Laidlaw, Crook Co. (*Whited*, Wa; no fr.). Big Sheep Creek, Wallowa Co., 1,410 meters (*Sheldon* 8616, SL). Shore of Klamath Lake, near Modoc Point (*Coville* 1332, Wa; no fr.). Silver Lake to Ft. Klamath (*Furlong, etc.*, Ca; no fr.). Klamath Indian Reservation, Valley of

Sprague River (*Coville* 1319, Wa). Hood River (?, Ca; no fr.). Western Oregon, river bottoms (*Howell*, Be, UW; no fr.). Klamath Co., south of Beaver Marsh, Crescent (*Abrams* 9671, La). Yaquina Head, Lincoln Co. (*J. C. Nelson* 410, P). Sauvies Island (*Howell*, P).

CALIFORNIA: Lassen Co., Amadee (*B. Davy*, Ca). Amadee, Honey Lake Valley (*B. Davy*, Ca; *proc.*). San Francisco (*Andersson*, St; *proc.;* leaves only). Lake Merced, San Francisco (*Eastwood*, Ch). Coloma (*Andersson*, St; *proc.*). Goodyear, Solano Co., common in marshes (*Baker* 3219, MW, photo.; type of *R. procerus* Greene). Northern Coast Ranges, brackish marsh near Samoa, 0–150 meters (*Tracy* 3148, Ca; *proc.*). Along streamlet, Bold Mt. between High Prairie and Snow Camp, Humboldt Co., 1,050 meters (*Tracy* 4578, Ca; no fr.). Berkeley, marshes (*B. Davy* 722, Ca; *proc.*). Warner Mts., Modoc Co., 2,190 meters, meadows, head of North Fork, Parker Co. (*Taylor & Bryant*, Ca; no fr.). Willow Creek (*Nutting*, Ca). Without locality (*Andersson*, St; *Bolander*, Wa; both *proc.*).

Rumex fenestratus differs from *R. occidentalis* by its twice as large fruiting perigonia and nutlets. In size and form of the leaves, whether crisped or not, and in outline of the valves, both species are variable.

The specimens from Vancouver Island are distinguished by the thick consistency of their leaves and by having their nerves papillose-pubescent beneath. I can not see the differences suggested by Greene in his descriptions concerning articulation of pedicels and outline of valves, or at least they are not sufficient to distinguish the insular and continental plants.

As to the relations between *R. fenestratus* and *R. occidentalis*, and the geographic distribution, see the discussion of the latter species.

Two forms seem to deserve separation:

Var. **procerus** (Greene) Rech. f., comb. nov.—*R. procerus* Greene, Pittonia 4: 305. 1899–1901. Differt a typo caulibus usque duplo longioribus et crassioribus, inflorescentia ampliore, valvis subminoribus.

This variety is limited to the western middle sections of California, that is, to the most southwestern part of the area of *R. fenestratus*. It occurs there "in wet, boggy depressions among the coast hills, about San Francisco Bay and Monterey," in exceedingly low localities compared with the extremely southern situation. The distinction from the type does not seem to be very clear. (See above, the specimens marked "*proc.*")

Var. **labradoricus** Rech. f., var. nov.—Differt a typo imprimis valvis sublongioribus, ambitu saepe subtriangularibus, plerumque acutis.

This variety is not clearly distinguished from the type. It occupies the most eastern parts of Canada and is separated from the principal area of the type by a large zone inhabited by *R. occidentalis*. (See above, the specimens marked "*labrad.*")

Explanation of Figure 22, a.—Valves of *Rumex fenestratus*, 4 times natural size; Idaho, *Macbride* 3812.

36. **Rumex Patientia** L.

Somewhat similar to *R. crispus*, from which it differs by its usually taller habit, larger, pale green, not so distinctly crisped leaves, these broadest below the middle, petioles flat on the upper side, larger, more cordate valves with proportionately smaller grains and larger nutlets.

SYNONYMY: L. Sp. Pl. 33. 1753; Macoun 354. 1888; Trelease 82. 1892; Britt. & Brown 550. 1896; Gray 355. 1908; Rydb. R. 232. 1922; Tidestrom 160. 1925; Rydb. P. 279. 1932; Rech. f. Vorarb. 2 in Repert. Sp. Nov. 31: 246. 1933.

A rather polymorphic species, originally from southeastern Europe and Asia. Most American specimens belong to the subsp. *eu-Patientia* Rech. f. op. cit. 246, with only one valve grain-bearing; but some of them approach by the still larger fruiting perianths, with three grains of unequal size, the subsp. *orientalis* (Bernh.) Danser; cf. Rech. f. op. cit. 253.

CANADA: Waste places, Ottawa (*Macoun* 5876, O). Roadside and fields near Belleville (*Macoun* 23760, O; approaching *orientalis*).

DISTRICT OF COLUMBIA: Washington (*Steele*, Ko; approaching *orientalis*).

WISCONSIN: Blue Mounds (*Fassett* 2955, La).

IOWA: Fayette (*Fink*, G).

KANSAS: Waste places, Riley Co. (*J. B. Norton* 449, La, UW; approaching *orientalis*).

MISSOURI: Courtney, waste ground (*Bush* 9789B, NY).

UTAH: Lehi, moist bottom (*Goodding* 1167, Wa, La).

WASHINGTON: Waitsburg (*Horner* 184, P). Spokane (*Turesson*, La).

37. Rumex crispus L.

Stem straight, erect, without axillary branches; leaves cuneate at the base, wavy-margined; petioles somewhat canaliculate on the upper side; panicle elongated, the whorls usually dense and approximate, the pedicels about 1.5 times longer than the fruit; valves round-ovate, subcordate, the margin entire or minutely erose, usually with 3 equal or unequal grains, rarely with only one.

SYNONYMY: L. Sp. Pl. 335. 1753; Pursh 247. 1816; Campdera 95. 1819; Hook. 129. 1840; Meisn. apud DC. 44. 1856; Wats. 9. 1880; Macoun 416. 1883; Trelease 84. 1892; Britt. & Brown 551. 1896; Small 370. 1903; Piper 225. 1906; Gray 355. 1908; Woot. & Standl. 192. 1915; Rydb. R. 232. 1922; Jepson 292. 1923; Tidestrom 160. 1925; Rydb. P. 280. 1932; Rech. f. Vorarb. Monogr. Rumex 3: 44. 1933.

A polymorphic species as to the form of leaves, size of fruiting perigonia, grains, etc.

Indigenous in Europe and Asia, introduced to all parts of the world and partly naturalized. In America students have generally assumed that it has only been naturalized, but, as the data cited from labels indicate, this seems open to question, especially as concerns those from the Rocky Mountains. In the following citations habitat for specimens noted by the collectors as from waste places or clearly as "weeds" has been omitted, only natural habitats being cited.

NEWFOUNDLAND: Bushy cove, Bay of Islands, garden (*Waghorne*, Z). Valley of Exploits River, low, damp clearings, Grand Falls (*Fernald & Wiegand* 5333, Ke). Region of Humber Arm, Bay of Islands, Summerside (*Fernald & Wiegand* 3285, G).

NOVA SCOTIA: Main Station (*H. St. John*, Ko, Ke).

ONTARIO: Kingston (*Fowler*, Wa).

ALASKA: Juneau (*Anderson* 2A-163, L). Treadwell (*Dicht*, NY). Kodiak, Sitkalidak Island, on seashores, Port Hobron (*Eyerdam* 123, 129, L, MW). Fairbanks (*J. P. Anderson* 1288, MW).

NEW HAMPSHIRE: Philbrook Farm, Shelburne (*Deane*, Wa).

MASSACHUSETTS: Amherst (*Sturns*, Wa). Mt. Washington (*Meredith*, St). Marblehead (*Harper*, P).

CONNECTICUT: Vicinity of Green's Farms (*Pollard* 74, Wa).

NEW YORK: Vicinity of Clove, Dutchess Co. (*Standley & Bollman* 12338, Wa).

DELAWARE: Greenbank (*Commons*, NY).

MARYLAND: Below Great Falls, Bank of C. & O. Canal (*Maxon* 6331, Wa).

VIRGINIA: Open woods below Potomac Falls (*Norton* 268, Wa). Norfolk (*Kearney* 1280, Wa). Suffolk, Nansemond Co. (*Heller* 961, Wa). Brancheville, Southampton Co. (*Heller* 961, Bo).

NORTH CAROLINA: Ocracoke Isl., Hyde Co. (*Kearney* 2295, Wa).

GEORGIA: McDuffie Co., along small stream in the open northwest of Thomson (*Bartlett* 2595, Wa). Savannah (*Kolthoff*). Savannah, Chatham Co. (*Moldenke* 1189, St, SL).

ALABAMA: Dry, open prairies, Marion (*C. Mohr*, Wa).

OHIO: Jamestown (*Wooton*, Wa).

MICHIGAN: Vicinity of Michigan Biological Station (*F. C. Gates*, MW, Ch).

WISCONSIN: Yard, Green Bay (*Schuette*, SL). Madison (?, Ko). Mt. Hope, Grant Co. (*Williams*, NY).

ILLINOIS: Southern Lake Co. (*Buhl* 640, MW). Cook Co. (*H. N. Smith* 5650, Bu). St. Clair Co. (*Eggert*, Le).

IOWA: Fayette Co. (*Fink*, Wa). Ames (*Ball & Combs* 513, Ko). Ames, Watkin's Well (*Kellogg* 46, Wa).

SOUTH DAKOTA: Deadwood, creek banks (*Rydberg* 5, NY, NW, Wa).

MISSOURI: Jerome (*Kellogg* 516, Wa). Springfield (*Standley* 8431, Wa). Courtney (*Bush* 9791, Ke). St. Louis (*Egeling*, Bu).

ARKANSAS: Without locality (*Rafinesque*, De).

KANSAS: Pittsburg (*Rydberg & Imler* 184, NY). Hoisington (*Rydberg & Imler* 1293, NY).

MISSISSIPPI: Columbus (*Mohr*, Wa). Starkville (*Tracy*, SL).

LOUISIANA: New Orleans (*Drummond* 282, Lu, Ke, MW). Gretna (*Ball* 334, SL, Ca, Wa). New Orleans (*Mellichamp*, SL).

TEXAS: Denison (*Reverchon*, SL). Reunion (*Reverchon*, SL). Dallas (*Reverchon*, SL). Victoria (*Eggert*, SL). Canyon, Randall Co. (*Palmer* 14013, SL). Austin, flood plain of Colorado River (*Armer*, Wa). Rio Grande Valley, Canutillo (*Barlow*, Ch).

MONTANA: Kalispell (*Blankinship*, SL). Low thickets along Swiftcurrent Creek, below Lake McDermott, 1,350 meters (*Standley* 15539, Wa).

WYOMING: C Y Ranch (*A. Nelson* 615, SL). Laramie, Albany Co., loose, rich soil (*Nelson* 8196, SL). Dry, open ground near Laramie, 390 meters (*C. J. Goodman* 867, SL).

COLORADO: Boggy pastures, 1,650 meters, Paradox, Montrose Co. (*Walker* 342, Be, Wa). Grand Junction (*Hedgcock*, SL). Colorado Springs (*Trelease*, SL). River bottom, Brighton (*Johnston* 524, SL). Woods along creek, Boulder, 1,530 meters (*H. C. Hanson* C464, SL). Ft. Collins, 1,500 meters (*J. H. Cowen*, SL). Mesa Verde (*Schmoll* 1788, La).

NEW MEXICO: Chama (*Baker* 295, Wa, SL, Bo). Mangas Springs, 18 miles northwest of Silver City, Grant Co., 1,430 meters (*Metcalfe* 157, Ke, SL). South end of Black Range, 1,650 meters (*Metcalfe*). Pecos River (*Coghill* 86, SL). Mesilla Park, Experiment Station Farm (*Standley*, SL). Near Pecos, San Miguel Co., 2,010 meters (*Standley* 5308, SL). Pecos National Forest, Winsors Ranch, 2,520 meters (*Standley* 4267, SL). Santa Fe (*Mulford* 1307, SL). Sandia Mts., Balsam Park, 2,460 meters (*Ellis* 259, SL). Vicinity of Ensenada, Rio Arriba Co., creek bottoms (*Standley & Bollman* 11087, Wa). Crains Ranch (*Wooton*, Wa). White Mts., Lincoln Co. (*Wooton & Standley*, Wa).

WASHINGTON: Wenatchee, Kittitas Co. (*Whited* 1252, Wa). Egbert Spring, Douglas Co., 390 meters (*Sandberg & Leiberg* 400, Ko, St, Ke, P, SL, Wa). San Juan Islands, Friday Harbor (*Zeller* 944, SL; 942, NY). Seattle (*Piper* 698, Lu, SL; *Zeller*, SL; *Bardell*, SL; *Freiberg*, SL; *Mosier*, Wa). Pierce Co. (*Davison*, P). Columbia Co. (*Darlington*, P).

OREGON: Shirk, low grounds in water, 1,500 meters (*Leiberg* 2587, Wa, St). Klamath Indian Reservation (*Coville* 1532, Wa). Shore of Klamath Lake, near Modoc Point (*Coville* 1333, Wa). Riddles (*Ward* 67, Wa). Willamette Heights, Portland (*Sheldon*, SL). Marion Co., Bush's Pasture (*Thompson* 4900, SL). Bank of small stream northeast of Brownsboro, Jackson Co., 720 meters (*Applegate* 2396, Wa; young specimen).

IDAHO: Forest, Nez Perce Co., 1,050 meters (*Heller* 3481, Ca, SL). New Plymouth (*Macbride* 240, P, SL, Wa). Camas Prairie, Blaine Co., meadow, 1,710 meters (*Macbride & Payson* 3822, SL). Coeur D'Alene Mts., divide between Mullon and Canyon Creek, 1,200 meters (*Leiberg* 1504, SL). Hailey (*Henderson* 3361, Wa). Boise, 840 meters (*Clark* 122, SL, St). Boise (*Mulford*, SL). Wet meadows, shores of Lake Pend d'Oreille (*Leiberg* 563, SL).

NEVADA: Kings Canyon, Ormsby Co., 1,700–2,000 meters (*Baker* 1201, SL, Ca, Bu). On slopes, Glenbrook on Lake Tahoe, 1,860 meters (*Tidestrom* 10293, St). Corey Canyon, Wassuk Mts., 2,040 meters (*Tidestrom* 10123, SL). Reno, 1,350–1,500 meters (*Hitchcock* 440, Wa).

UTAH: Grand River Canyon below Moab, 1,500 meters (*Rydberg & Garrett* 8492, Wa). Wasatch Mts., 1,650 meters (*Tidestrom* 547, Wa). Provo, 1,350 meters (*Jones* 5504, Wa, Ca, SL). Murray (*W. W. Jones*, Ca). Alta, Wasatch Mts., 2,700 meters (*Jones* 1183, Br, SL, Be, MW). Salt Lake City, 1,290 meters (*Jones* 2066, Bo, Bu). Salt Lake City, dry soil (*Pammel & Blackwood* 3611, SL).

ARIZONA: Pinal Creek (*Toumey* 3438, Wa). Chiricahua Mts., Miss Rhoda Rigg's Ranch, 1,650 meters, in running water (*Blumer* 1895, NY, Wa). Tucson (*Toumey*, Ca, Wa, NY). Santa Cruz bottoms near Tucson (*Griffiths* 4064, SL). Prescott (*Toumey*, Ca). Oak Creek (*W. W. Jones*, Ca). Rincon Mts. (*Toumey* 280, NY). Rincon Mts., Spud Ranch (*Blumer* 3497, Ca). Temple (*Griffiths* 4334, SL). Bisbee, along creeks (*Goodding* 1095, Wa, NY). Lower Miller Canyon, Huachuca Mts., moist, sandy ground (*Goodding* 188, NY). Flagstaff, 2,100 meters (*McDougal* 115, Be). Roosevelt (*Peebles, etc.*, 5213, Wa).

CALIFORNIA: Gualala, Mendocino Co. (*Taylor*, Ca). Near Comptche, Mendocino Co. (*Walker* 260, Ca). North Coast Ranges, Mendocino, Humboldt, and Del Norte Cos., between Camp Grant and Pepperwood (*Davy & Blasdale* 5487, Ca). Mendocino Co., Big River (*McMurphy* 237, NY; var. *advena* Danser?). Warner Mts., Modoc Co., 1,380 meters (*Taylor & Bryant*, Ca). Big Valley near Lookout, Lassen Co. (*Nutting*, Ca). Lassen Co., Honey Lake Valley, wet, adobe meadows (*B. Davy* 3378, Ca). Near Redding, Shasta Co. (*Heller* 7875, Ca, MW). Mt. Shasta and vicinity, Siskiyou Co. (*Palmer* 2524, Wa). Siskiyou Co., along creek near Yreka (*Butler* 513, 971, Ca, Wa). Valley of Van Duzen River, opposite Buck Mt., 300 meters, Humboldt Co. (*Tracy* 2806, Ca). Meadows on mountain side, 3 miles northwest of junction of Willow Creek with Trinity River, Humboldt Co., and near Beebe's Ranch, 900 meters (*Tracy* 3375, Ca). Santa Cruz Mts., Santa Clara Co., north embankment of Lake Lagunita (*Dudley*, Br). Santa Clara Co., foothills west of Los Gatos (*Heller* 7303, Ca). Little Chico Canyon (*Austin* 1937, Wa, SL). Santa Cruz (*C. H. Thompson*, SL). Boulder Creek, Santa Cruz Co. (*Walker* 743, Ca). Amador Co., vicinity of Ione, 60–150 meters (*Braunton* 1069, Ca, SL). San Francisco (*Harford & Kellogg*, SL). San José (?, Ca). Vicinity of Oakland (*Holder, Geol. Surv.* 2597, Wa). Berkeley (*H. A. Walker* 492, Ca; *B. Davy*, Ca; *Blankinship*, SL). Benicia (*Chandler* 7000, Ca). Crystal Spring Lake, San

Mateo Co. (*Elmer* 4266, NY, Be). Pine Grove, 660 meters, Amador Co. (*Hansen* 1794, SL, Be). Yosemite Valley, Transition Zone, 1,200–1,350 meters (*Abrams* 4639, Ca; *Hall* 9031, Ca). Panamint Canyon, Lower Sonoran Zone, 600 meters (*Hall & Chandler* 7043, Ca). Butte Co., Sierra Nevada at Chico Meadows, 1,200 meters, yellow pine belt, in wet turf, associated with *Senecio, Salix, Castilleja, Epilobium*, and *Sisyrinchium* (*Heller* 11595, Ca). Butte Creek, Butte Co. (*Austin* 632, Wa). Forest Ranch, Butte Co. (*Austin*, SL). Mt. Pinos, Ventura Co., Lockwood Valley, Upper Sonoran Zone, 1,560 meters (*Hall* 6696, Ca). By ditch near Weldon, Kern Co., 810 meters (*Wheeler*, Ca). San Bernardino Ranch, Mexican boundary (*Mearns* 637, Wa). San Bernardino (*Parish*, SL). Grant Lake City (*Scheuber*, Wa). San Luis Obispo Creek (*Guirado* 694, Wa). Soldiers Home (*Adams* 19, Ca). Orcutt (*Russell* 2216, SL). Avalon, Santa Catalina Isl. (*Trask*, Wa, Ke). Santa Cruz Isl., Prisoner's Harbor (*Adams & Wiggins* 123, Ca). Mecca, 57 meters (*Parish* 8617, Ca). San Jacinto Valley (*Reinhardt*, Ca). Jacinto Hot Springs (*Mearns* 3335, Wa). Los Angeles (*E. D. Palmer*, Ca). Claremont, Los Angeles Co. (*Burnett*, SL). Pasadena (*Grant* 1139, Wa). Antelope Valley (*B. Davy* 2279, Ca). San Antonio Mts., head of San Antonio Canyon, open ground along streams, Upper Transition Zone, 2,400 meters (*Johnston*, Ca). San Joaquin Co. (*Berg*, Ca). Head of San Joaquin Valley, green field near Bakersfield (*B. Davy* 1838, Ca). Owens Valley and Fort Tejon (*Geol. Survey*, Wa). Fort Tejon (*B. Davy*, 2380, Ca). Laguna (*Schoenfeldt* 368, Wa). Antioch, Contra Costa Co. (*B. Davy* 976–977, Ca). Jersey Isl., Contra Costa Co. (*Wiggins* 4605, Ca). Rumsey, Yolo Co. (*Tracy & Storer*, Ca). Near Norman, Glenn Co. (*B. Davy*, Ca). Glenn Co., Bennet Spring, on Newville road (*Heller* 11539, NY). Suisun (*H. A. Walker* 990, Ca). Santa Ysabel (*Henshaw* 3, Wa). Hayward (*Jepson*, Ca).

MEXICO: Orizaba (*Botteri* 109, Wa, Ke). Orizaba (*C. Mohr*, Wa). In graminosis, Huatusco, Veracruz (*Mohr*, Wa). Sianori, Durango (*Ortega* 5352, Wa). San Ramón, Durango (*Palmer* 156, Wa, G). Hidalgo, Tula, 2,040 meters (*Pringle* 6584, Wa). San Lorenzo (*Liebmann* 699H, Ko). Chihuahua, near Colonia García in the Sierra Madre, 2,220 meters (*Townsend & Barber* 82, St, MW, Wa). Chihuahua, 1,300 meters (*Palmer* 97, Ch, Wa, G; 223, Ch, Wa, G). Ex convalli San Luis Potosí, in paludosis (*Schaffner*, Ke). In paludosis ca. urbem (*Schaffner* 907, Ke). Vallée de Mexico (*Bourgeau* 201, Be, Ke). Morales (*Schaffner* 903, Ke). Querétaro (*Bro. Agniel* 10481; *Agniel & Arsène* 10476, Wa). Cerro Guadalupe, 2,250 meters, vicinity of Puebla (*Arsène* 92, Wa). Vicinity of Puebla, Laguna San Baltasar, 2,140 meters (*Arsène*). Vicinity of Puebla, Rancho Posado (*Arsène* 70, Wa). Laguna près de Morelia (*Arsène*, Ke). Laguna au nord, Morelia, Michoacán, 1,800 meters (*Arsène* 3017, Wa). Hermosillo, Sonora (*Rose, Standley & Russell* 12503, Wa). Nuevo León, Saltillo (*Gregg*, NH).

BERMUDA: Fields, Warwick Pond (*Brown & Britton* 345, NY, Ca). Harrington House (*S. Brown* 677, Ko).

HAITI: Marmelade, Dept. du Nord, 800 meters (*Leonard* 8389, Wa). Foleur road, vicinity of St. Louis du Nord (*Leonard* 14390, Wa). Massif des Echos, Pte. Riv. de l'Artibonite, Perodin, 900 meters (*Ekman* 3486, Wa).

JAMAICA: Farm Hill (*Orcutt* 3337, Ca).

PUERTO RICO: Prope Maricao ad ripam fluminis (*Lindau* 242, Wa). Road from Ponce to Adjuntas (*Underwood & Griggs* 731, Wa). Ad vias, Adjuntas (*Stahl*, Z). Prope Aibonito ad la Lima (*Lindau*, H). Sierra de Luquillo in reg. media montis Jimenes, in pratis (*Sintenis* 1522, Ke).

MARTINIQUE: St. Pierre, prairie, jardin (*Louis-Arsène* 197, NY).

38. **Rumex conglomeratus** Murr.

Lower leaves cordate at the base, plane; branches of the panicle divergent; whorls nearly all with a leaf, remote; pedicels usually not longer than the fruit; valves 2.5–3 mm. long, entire, each bearing a large grain.

SYNONYMY: Murr. Prodr. Fl. Gött. 52. 1770; Meisn. apud DC. 49. 1856; Wats. 9. 1880; Trelease 90. 1892; Britt. & Brown 551. 1896; Small 371. 1856; Piper 226. 1906; Gray 356. 1908; Jepson 292. 1923.

A weed of European origin, naturalized in extra-tropical parts of the New World.

BRITISH COLUMBIA: Vancouver Isl., Bamfield (*Anderson* 7223, P). Nanaimo (*Macoun* 83938, Ch).

VIRGINIA: Near Ocean View Station, Norfolk (*Coville* 3, Wa). Norfolk (*Curtiss*, Ch).

NORTH CAROLINA: In oriente . . . locis vastis (*McCarthy*, Wa).

ARIZONA: Hot Springs (*Toumey*, 343d, Wa). Phoenix (*Toumey* 343b, Wa).

TEXAS: Wet, sandy ground, Huntsville, Walker Co. (*E. J. Palmer* 12035, La, Ca, Br).

WASHINGTON: Seattle (*Piper* 627, P, SL). McGowan, Pacific Co. (*Spiegelberg* 636, P; form with longer pedicels). Whidbey Island (*Gardner* 257, P).

OREGON: Columbia Co., damp ground in city auto park, Clatskanie (*Thompson* 3723, SL). Newport, Lincoln Co., beach (*Spillman* 165, P). Ballast, Linnton, Portland (*Suksdorf* 1931, P). Hillsboro, Washington Co. (*H. H. Smith* 4098, 6031, P, Ch). "Plat B" (*Haydon* 244, Ch).

CALIFORNIA: Humboldt Co., Eureka, 0–150 meters (*Tracy* 3164, Ca). Siskiyou Co., along ditch near Yreka (*Butler* 514, Ca). Mendocino Co., near Comtche (*Walker* 373, Ca). Santa Clara Co. (*Demaree* 9202, SL). Mendocino Co., near Mendocino, sea level to 150 meters (*H. E. Brown* 840, SL, Ca). Near San Francisco (*Brandegee*, SL). Berkeley (*B. Davy* 721, Ca; *Blankinship*, SL). Saratoga, Santa Clara Co. (*B. Davy*, Ca). Boulder Creek, Santa Cruz Co. (*H. A. Walker* 771, Ca). Santa Cruz (*Anderson*, SL; *C. H. Thompson*, SL). Lake Co., Kelseyville, weed in waste places (*Blankinship*, SL). Amador Co., Clinton, 600 meters (*Hansen* 1747, SL). Amador Co., Ione, 60–150 meters (*E. Braunton* 1048, SL). Yosemite Valley (lower end), Transition Zone, 1,200 meters (*H. M. Hall* 9107, Ca). Los Angeles (*Miss E. D. Palmer*, Ca). San Joaquin Co. (*Sanford* 46, Ca). San Joaquin Co., Stockton, irrigating ditch (*Sanford* 27, Ca; 1548, SL). San Bernardino, wet places (*Parish* 11429, Ca, SL). San Bernardino Co., damp land, meadows, 300 meters, San Bernardino Valley (*Parish* 11429, Ca). San Mateo Co., Crystal Springs Lake (*Elmer* 4276, SL). Flats along San Mateo River near ocean, San Diego Co. (*Wiggins* 2987, Ca). Witch Creek, San Diego Co. (*Alderson*, Ca). San Luis Obispo Co., Santa Cruz Canyon (*Barber*, Ca). Santa Catalina Isl. (*Nuttall* 895, Ke). Avalon, Santa Catalina Isl. (*Trask*, Ke). Orcutt (*Russell* 2217, 2218, SL). San Jacinto Valley (*Reinhardt*, Ca). Mill Valley, Marin Co. (*Bioletti*, Ca). Mission Valley (*Brandegee*, Ca). Elsinore, moist soil (*A. J. M.*, Ca). Hayward (*M. A. King*, Ca). Sonoma Co., along Sonoma Creek, at foot of Mt. Hood (*Heller* 5770, SL). Sonoma Co., Bennett Valley, southeast of Santa Rosa (*Heller* 5660, SL). Claremont (*A. R. Davis*, SL). Without locality (*Austin* 125, SL).

MEXICO: Hidalgo, Tula, 2,040 meters (*Pringle* 6369, UW, Wa, NY, Ca, Be, H, M, Z; sub nomine *R. Berlandieri*). Michoacán, Morelia (*Arsène* 3332, Wa).

HAITI: Vicinity of Mission, Fonds Varettes, 1,000 meters (*Leonard* 3813, Wa).

39. **Rumex sanguineus** L.

Lower leaves cordate at the base, plane; branches of the panicle divergent, only the lower whorls with a leaf, all remote; pedicels about 1.5 times as long as the fruit; valves 3–3.8 mm. long, entire, only one with a grain, the others usually grainless.

SYNONYMY: L. Sp. Pl. 334. 1753; Pursh 247. 1816; Campdera 65 and 94. 1819; Hook. 130. 1840; Meisn. apud DC. 49. 1856; Macoun 417. 1883; Trelease 90. 1892; Britt. & Brown 551. 1896; Small 371. 1903.

Though this species is mentioned by many American authors as introduced from Europe, I have seen only one American specimen. Perhaps it has sometimes been confused with other species, especially *R. conglomeratus*.

OREGON: Auf fremder Erde (ballast) in Linnton bei Portland (*Suksdorf* 1699, P).

40. **Rumex Britannica** L. Figure 22, *b*

Perennis. Caulis validus stricte erectus, profunde canaliculato-sulcatus, saepe purpurascens, 60–160 cm. altus, infra inflorescentiam non ramosus. Ochreae bruneae maiusculae cito evanescentes. Folia basalia ambitu oblongo-lanceolata usque ad 50 cm. longa, ad 20 cm. lata, latitudine 3–4-plo longiora, in vel infra medium latissima, basi oblique truncata vel late cuneata raro rotundata, apice acutiuscula vel rotundata, subplana vel ± undata et margine insuper minute crenato-crispata, utrinque glabra et levia vel subtus ad nervos scabriuscula, consistentia in sicco crasse membranacea vel tenuiter coriacea rigidula; nervi secundarii foliorum fere recti vix curvati, a primario angulo ca. 60°–80° abeuntes, subtus valde prominentes. Petiolus foliorum basalium laminam ± aequans. Folia caulina inferiora e basi rotundata vel latiuscule cuneata lanceolata, latitudine ca. 4-plo longiora, basin versus latissima, apicem versus sensim angustata; petiolus latitudinem folii ± aequans. Folia caulina superiora anguste lineari-lanceolata subplana breviter petiolata. Rami inflorescentiae plerumque breves e basi arcuata leviter divergentes ± stricte erecti superiores singuli simplices, inferiores foliis suffulti saepe elongati saepe fasciculati plerumque terni iterum ramosi, paniculam angustam brevem vel elongatam in statu fructifero ± compactam formantes. Florum glomeruli multiflori omnes plerumque approximati, fructificationis tempore contigui, pedicelli fructiferi validiusculi, in quarta circiter parte inferiore tenuiter articulati, basin perigonii versus sensim paulo dilatati, perigonio maturo 1.5–2 (–2.5) -plo longiores. Perigonii foliola exteriora ovato-lanceolata latiuscula subobtusa, 2–2.5 mm. longa, basibus interiorum accumbentia. Perigonii folia interiora (valvae) in statu fructifero 4–6 mm. longa, 4.5–7.5 mm. lata, longitudine plerumque evidenter latiora, ambitu cordato- vel reniformi-rotundata basi ± late emarginata, apice rotundata vel latissime rotundato-acuminata, margine subintegra vel imprimis basin versus minute et irregulariter crenulato-denticulata, colore carneo-bruneo vel stramineo, iuniora saepe purpureo-suffusa, consistentia rigide membranacea. Valvae facie subaequaliter et valde prominenter reticulato-nervosae, omnes calliferae; nervi basi (quo ex callo excurrunt) saepe incrassati. Calli subaequales elongato-fusiformes, semper a basi valvae aliquantum remoti ideoque nervo mediano quasi stipitati, apice in nervum medianum acute transientes, dimidia longitudine valvae semper evidenter longiores, leves. Nux matura brunea 3.5 mm. longa, ca. 2 mm. lata, utrinque subaequaliter acuminata, in medio circiter latissima.

SYNONYMY: *R. Britannica* L. Sp. Pl. 334. 1753; Gray, Proc. Amer. Acad. 8: 399. 1870; Trelease 831. 1892; Britt. & Brown 550. 1896; Gray 355. 1908; Woot. & Standl. 192. 1915; Rydb. P. 280. 1932. *R. orbicularis* Gray, Man. ed. 5. 420. 1868; Macoun 415. 1883. *R. hydrolapathum* var. *americanus* Gray; *R. Britannica aquaticus* Pursh, Fl. 248. 1816. *R. acutus* Hook. Fl. 2: 130. 1840, non L. *R. sanguineus* Hook. Fl. 2: 130, p.p.

ILLUSTRATIONS: Trelease, *pl. 21.* 1892; Britt. & Brown 550. 1896 (very bad).

DISTRIBUTION: Lowland districts of Canada and eastern and middle United States.

NEWFOUNDLAND: Region of Humber Arm, Bay of Islands, brackish swamp (*Fernald & Wiegand* 3287, Ke, O; *borealis*).

NOVA SCOTIA: Sable Island, at Life Saving Station, swampy edge of fresh-water pond (*St. John* 1200, O, Wa, Ko; *borealis*). Bridgewater (*Macoun* 83951, O). Sable Island, very rare (*Macoun* 22595, O). Common in swamp, Boylston (*Hamilton* 24676, O). Digby (*Macoun* 83952, O). By a lake near Louisburg, Cape Breton Isl. (*Macoun* 20215, O).

NEW BRUNSWICK: Gloucester Co., brackish margin of Tête-à-Gouche River, Bathurst (*Williams & Fernald* 69122, O; *borealis*).

PRINCE EDWARD ISLAND: Marshes near Tracadie (*Macoun* 23695, O).

QUEBEC: Magdalen Isl., wet bogs and mossy pond margins among the sandhills between East Cape and East Point, Coffin Isl. (*Fernald, Long & St. John* 7329, NY, O, Wa, Ko; *borealis*). Ste. Thérèse, Lac Tourbeux (*P. Ls.-Marie*, MW). Tourbières de St. Hubert, vicinity of Longueuil (*Victorin* 9770, Wa). Ile du Bic, cordon littoral (*Rousseau* 30059, St; *borealis*). Saguenay Co., River Etamamion, Charny (*St. John* 90399, O; *borealis*). Along the Pêche River, above Wakefield (*Macoun* 60813, O). Low ground along brooks and in river marshes, mouth of the Restigouche (*Macoun*, O). Low ground near Matane Gaspé (*Macoun* 23694, O). Below Cap à l'Aigle, Port à Persis (*Macoun* 67752, O). In swamp, Granby (*Scott* 12905, O).

ONTARIO: High Park, Toronto (*Macoun* 54766, O). Wet places, Pt. Edward, River St. Clair (*Macoun* 23696, O). St. Patrick's Bridge, Ottawa (*Macoun* 5871, O). Marsh below Britannia (*Macoun* 83762, O). Swamp, Britannia (*Harrington* 1906, O). Moose Creek (*Macoun* 1568, O). Ottawa, Hemlock Lake (*Macoun*, O). Swamp near New Edinburgh (*Harrington* 1904, O). Georgian Bay (?, O). Brewery Creek below Chelsea Road (*Macoun* 83760, O).

MAINE: Mount Desert, Seal Cove (*Bicknell* 3932, NY). Mt. Desert, Eden St. Cove (*Bicknell* 3931, NY). Orchard, Aroostook Co. (*Fellows* 6904, Wa).

MASSACHUSETTS: Shore of Fishers Pond, West Tisbury, Martha's Vineyard (*Seymour* 1177, Wa, NY). Swamp, Natick (*Chamberlain & Knowlton*, Wa). Essex Co. (*Oakes*, Ke). Woburn, swamp (*Morong*, NY). Cottage City (*Curtis?*, Ha).

RHODE ISLAND: Olneyville (*Congdon*, Ch).

NEW YORK: Ithaca (*Coville*, Wa). Arlington (*S. F. Henser*, Be). Vicinity of Clove, Dutchess Co., marsh (*Standley & Bollman* 12163, Wa). Long Island, Suffolk Co., brackish marsh, White Brook, Southampton (*St. John* 2706, Wa).

NEW JERSEY: Budd's Lake, Sussex Co. (*J. K. Small*, Wa, Ko). Lake George (*Vasey*, Wa). Califon, Hunterdon Co. (*Fisher*, Wa). Stockholm (*van Sickle*, Wa).

MICHIGAN: Near Port Huron, St. Clair Co. (*C. K. Dodge*, St, Wa). Hubbardston (*Wheeler*, Wa).

OHIO: Cleveland, wet places (*Krebs* 584, Be). Perkins, Erie Co. (*Mosely*, Wa).

INDIANA: Swamps and marshes, Clarke (*Umbach*, Wa). Muncie (*Brady*, Ca). Pine (*Duesner*, Ch).

WISCONSIN: Without locality (*Schuette*, NY). Greenfield, in water (?, NY). Fort Howard (*Schuette*, Ch).

ILLINOIS: Peoria (*Mendel*, H). Ringwood (*Vasey*, UW).

MINNESOTA: Itasca Park, headwaters of Mississippi River, Clearwater Co., Iron Springs (*Grant* 3115 or 3175, Ca, NY). Fort Snelling (*Mearns* 829, Wa). Sandy Lake (*Sandberg* 808, Wa). Long Lake, Kandiyohi Co. (*Metcalfe* 2167, Wa).

IOWA: Kossuth Co. (*Cratty & Pammel* 584, Wa, Be). Wet ground, Fayette Co. (*Fink* 540, Wa). Hanging bog, 3 miles southwest of Laboratory, Lake Okoboji, Dickinson Co. (*Conard*, MW).

NORTH DAKOTA: Camp Lake, Underwood (*Metcalfe* 416, Wa).

SOUTH DAKOTA: Wet places along Sioux River, Brookings (*Williams*, Wa).

NEBRASKA: Cody's Lake at head of Dismal River, swamp (*Rydberg* 1670, Wa, Be). South Cody Lake (*Thomson* 227, Wa). Lomo, Keyapaha Co. (*Clements* 2896, Wa). Dewey Lake (*Thomson* 98, Wa).

Rumex Britannica is not related to any other American species but only to the European *R. Hydrolapathum* Huds. This relationship was already recognized by Gray, who called the American plant *R. Hydrolapathum* var. *americanus*. *R. Hydrolapathum* shows a similar nervation of leaves and also elongate and narrow valve grains, but is easy to distinguish by its longer basal leaves, of more leathery consistency, and by its triangular, acute valves.

The name *R. Britannica* is used here in the sense of Trelease and subsequent authors. The identity of this plant with Linné's *R. Britannica* is not clear to me. Earlier authors seem to have confused it with *R. altissimus* Wood. Perhaps it would be more cautious to use the name *R. orbicularis* Gray.

Mr. H. W. Pugsley of London kindly undertook to examine for me the specimen of *R. Britannica* in the Linné Herbarium. He wrote that the specimen deposited there under the name *R. Britannica* is not absolutely a type, because there is no evidence of the date at which it was inserted in the herbarium. It consists of a small branch with narrow leaves, without axillary branches. The fruiting pedicels are 7–15 mm. long and the valves triangular, about 5 mm. long and broad. These characters for the most part seem not to agree with *R. Britannica* of authors.

In the northeastern parts of its area (Nova Scotia, Quebec), *R. Britannica* occurs usually in a form differing in some respects from the type. I am not sure whether this represents a geographic race or rather an occasional modification.

Var. **borealis** Rech. f., var. nov.—Differt a typo caule humiliore, saepe crassiore, panicula fructifera breviore magis compacta ramis paucis brevibus appressis vel subnullis, foliis multo minoribus proportione angustioribus, basi apiceque subaequaliter angustatis, consistentia crassioribus, in medio circiter latissimis, basalibus extremo apice saepe breviter rotundatis, valvis fructiferis sublatioribus, ad 8.5 mm. latis.

Specimens belonging to this variety in the list of specimens examined are noted as "*borealis.*"

Explanation of Figure 22, b.—Valves of *Rumex Britannica* L., 4 times natural size, from *Macoun* 83951.

41. **Rumex obtusifolius** L.

Lower leaves broad, deeply cordate at base, flat, the upper rounded at base, narrower, lanceolate; branches of the panicle divergent; only the lower flower verticils with leaves and remote; pedicels slender, to 2½ times as long as the fruit, jointed near the base; valves 5–6 mm. long, usually one of them bearing a grain, with two or three often very pronounced teeth on each side.

Indigenous in Europe, introduced to North and South America, South Africa, eastern Asia, etc. The species is very polymorphic and is represented in Europe by four subspecies. Most of the American specimens belong to the West European subspecies *agrestis* (Fries) Danser (see Rech. f. op. cit. 1: 45), characterized by leaves somewhat papillous on the under side along the nerves and by large (about 6 mm.) fruiting perigonia with toothed segments, usually one of them bearing a grain. Only one specimen belongs to the Central European subsp. *transiens* (Simonkai) Rech. f. op. cit. 52, characterized by somewhat smaller fruiting perigonia with 3 usually unequal grains and shorter fruit segments.

SYNONYMY: L. Sp. Pl. 335. 1753; Pursh 248. 1816; Campdera 87. 1819; Meisn. apud DC. 54. 1856; Wats. 9. 1880; Macoun 412. 1883; Trelease 91. 1892; Britt. & Brown 552. 1896; Small 371. 1903; Gray 356. 1908; Woot. & Standl. 193. 1915; Rydb. R. 232. 1922; Jepson 293. 1923; Tidestrom 160. 1925; Rydb. P. 280. 1932; Rech. f. Vorarb. Monogr. Rumex 1: 41. 1932; Vorarb. 2: 46. 1933. *R. crispatulus* Michx. Fl. Bor. Amer. 1: 217. 1803; Campdera 88. 1819; Meisn.

apud DC. 59. 1856, fide Fernald apud St. John, Rhodora 17: 77. 1915. *R. Rugelii* Meisn. apud DC. 54. 1856.

BRITISH COLUMBIA: Near mouth of Downie Creek (*C. H. Shaw*, Bu, UW). Victoria (*Anderson*, P). Popensa, New Westminster (*Anderson* 180, P).

ALASKA: Juneau, near beach (*Anderson* 2A-285, Lu). Skagway (*Enander* in 1913, St). Sitka (*Eastwood* 958, G). Unalaska (*Hultén* 7532b, Lu, MW). Akutan (*Norberg*, Lu).

NEW HAMPSHIRE: Connecticut Lake (*Sturns*, Wa).

MASSACHUSETTS: Shade, border of woods, Mt. Washington, Berkshire Co. (*Meredith*, St). Swampscott (*Harper*, P).

NEW YORK: Penn Yan, Yates Co. (*Wright*, Le). Northville, Long Island (*H. W. Young*, Wa).

NEW JERSEY: South Amboy (*Kelsey* 188, La).

PENNSYLVANIA: Lancaster (*Heller*, De). Upper Susquehanna, Sayre (*Barber*, Be). Hyndman, Bedford Co. (*Small*, Ch). Paradise Falls, 270 meters (*Bernhardt*, P).

DISTRICT OF COLUMBIA: Potomac Flats (*A. Ruth*, NY).

MARYLAND: Open fields near Clinton (*T. Holm*, Br). Washington (*E. S. Steele*, De, UW).

VIRGINIA: Bedford Co. (*Curtiss*, St). White Top Mt. (*Rydberg* 8122, NY). Vicinity of Chain Bridge (*Van Eseltine & Mosely* 22, 34, Wa).

GEORGIA: Athens (*R. M. Harper*, UW).

FLORIDA: Waste ground, Tallahassee, Leon Co. (*Moldenke* 1173, St).

OHIO: Hamilton Co. (*Matthes*, Be). Jamestown (*Wooton*, Wa). Cincinnati (*Lloyd*, P).

TENNESSEE: In paludosis ad French Broad River pr. Dandridge (*Rugel*, Be).

ILLINOIS: (*Eggert*, Le).

MISSOURI: (*Engelmann*, Be). St. Louis (*Geyer*, MW). Vacant grounds, Missouri Bot. Gard. (?, Lu, UW). Butler Co. (*H. H. Smith* 599, Ch).

IOWA: Decatur Co. (*Fitzpatrick*, La).

LOUISIANA: New Orleans (*B. Matthes*, Lu, Be).

KANSAS: Cherokee Co. (*A. S. Hitchcock*, UW).

OKLAHOMA: Pottawatomie Co. (*P. I. White*, Lu).

COLORADO: Fort Collins (*I. H. Cowen*, Be, Lu, Up; 3832, P).

NEW MEXICO: Kingston, Sierra Co., 1,980 meters (*O. B. Metcalfe*, Be, De).

UTAH: Farmington Canyon, near Salt Lake City, 1,290–1,650 meters, low woods near springs, common (*Pammel & Blackwood* 3639, Z).

ARIZONA: Chiricahua Mts., Barfoot Park, 2,400 meters (*J. C. Blumer*, Be).

WASHINGTON: Montesano (*Grant*, P, Be, Lu). Camp Lewis, Pierce Co. (*Davidson*, P). McGowan, Pacific Co. (*Spiegelberg* 694, P). Snohomish (*Sprague*, P). Sequim (*Grant*, P). San Juan Islands, Friday Harbor (*Peck* 12902, 13056, P).

OREGON: Portland (*Kellogg & Hartford* 869, NY; *Suksdorf* 3206, P). Hillsboro (*H. H. Smith* 6032, 6044, Ch).

CALIFORNIA: Requa, Del Norte Co. (*Duncan* 354, La). Boulder Creek, Santa Cruz Co. (*Walker* 769, Ca). Shasta Co., east of Round Mt., Hatchet Creek, 1,200 meters (*L. Benson* 2227, SL, NY). Humboldt Co., Eureka, 0–60 meters (*Tracy* 4077, Ca). Near Ferndale, Humboldt Co. (*B. Davy* 6169, B, Ca).

MEXICO: Veracruz, Jalapa, 1,400 meters (*R. Endlich*, Be). Federal District, Valley of Mexico (*Pringle* 7488, G). Morelos, Cuernavaca, Montes Las Tres Marías, 3,000–3,200 meters (*Fröderstrom & Hultén* 231, St).

JAMAICA: Hardware Gap, 1,200 meters (*Harris* 10113, Wa).

42. **Rumex pulcher** L.

Lower leaves small, cordate at base, somewhat crisp marginally, often pubescent beneath; branches of the panicle very divergent, often intricate in fruit; flower verticils partly with leaves, all remote; pedicels thick, not longer than the fruit, jointed in the middle; valves toothed 4.5–6 mm. long, 2.5–4.5 mm. wide, usually all bearing a grain, but grains often of unequal size; nutlets 3–4 mm. long, broadest a little below the middle.

Indigenous in the Mediterranean Basin. Introduced to North and South America, South Africa, etc. The species is very polymorphic and is represented in the Old World by five subspecies. The American specimens belong to the following three: subsp. *eu-pulcher* Rech. f. (see op. cit. 1: 26), characterized by leaves usually contracted above the base (panduriform), by valves obviously longer than broad, with relatively long teeth; subsp. *divaricatus* (L.) Murb. (*R. brevipes* Meisn. apud DC. 55. 1856; see Rech. f. op. cit. 1: 35), characterized by leaves usually not contracted and valves about as long as broad, with short teeth; subsp. *anodontus* (Hausskn.) Rech. f. (see op. cit. 1: 34), characterized by leaves usually not contracted and valves without teeth (or nearly so).

SYNONYMY: L. Sp. Pl. 336. 1753; Campdera 82. 1819; Meisn. apud DC. 58. 1856; Wats. 9. 1880; Trelease 91. 1892; Britt. & Brown 552. 1896; Small 371. 1903; Gray 357. 1908; Jepson 293. 1923; Rech. f. Vorarb. Monogr. Rumex 1: 25. 1932; Vorarb. 2: 46. 1933.

Subsp. **eu-pulcher** Rech. f.

VIRGINIA: Norfolk (*Ward*, Wa; no fr.; *Britton*, Ch). Virginia Beach (*Sudworth*, Wa). Williamsburg (*Grimes* 2692, NY; no fr.).

LOUISIANA: New Orleans (*Drummond*).

TEXAS: Columbia, Brazos River (*Bush* 208, NY; no fr.).

OREGON: Pasture, Port Orford (*Peck* 8467, NY; no fr.). Albina, Portland (*Suksdorf* 755, P).

CALIFORNIA: Humboldt Co., Alton, 30–90 meters (*Tracy* 3645, Ca). Seacoast at Shelter Cove, Humboldt Co. (*Bolander* 6568, Ca). Near Ferndale, Humboldt Co. (*Davy & Blasdale* 6171, Ca). Sonoma Valley (*J. Torrey* 422, SL). Pilarcitos Stone Dam, San Mateo Co. (*Elmer* 4778, Ca). Near Saratoga, Santa Clara Co. (*Pendleton* 222, Ca; no fr.). Pacific Grove, Monterey Co. (*Elmer* 4067, Ca; *Patterson*, Ca). Berkeley (*Blankinship*, Lu). San José (?, Ca; no fr.). Benicia (*Chandler* 6087, 6088, Ca). Oakland (*Davy*, Ca). Oak Park (*Unangst*, Ca). Chinese Garden, San Luis Obispo (*Condit*, Ca). Los Angeles Co., Inglewood, waste place (*Abrams*).

MEXICO: Valley of Mexico, 2,190 meters (*Pringle* 8518, Ca, St).

Subsp. **divaricatus** (L.) Murb.

FLORIDA: Moist, grassy field, Tallahassee, Leon Co. (*Moldenke* 1117, SL, St; no fr.). Tallahassee (*Harper*, Wa; no fr.).

LOUISIANA: New Orleans (*Drummond*, MW).

TEXAS: Sandy, open ground, Bryan, Brazos Co. (*E. J. Palmer* 11745, Ca, La, Br, MW). Low, sandy ground near bay, Morgans Point, Harris Co. (*Palmer* 11967, Ca, La, Br). Port Arthur, beach (*Kolthoff*, St). West of Troup (*Reverchon*, SL; no fr.). San Antonio (*Schulz* 2295, Ch).

CALIFORNIA: Los Angeles Co., Inglewood (*Abrams*, Ko). Pilarcitos Creek, San Mateo Co. (*Elmer*, SL, Wa, Be, MW). Sonoma Valley (*Torrey* 422, Wa, MW). Monterey (*Bailey*, Wa). "Flora of California, Arizona, etc." (*Palmer*, Be, MW). Foothill region, Blue Oak and Digger Pine Belt, Copperopolis, Calaveras Co., 300 meters (*Tracy* 5598, Ca).

MEXICO: San Angel (*Schiede*, Be). Vallée de Mexico (*Bourgeau*, Ke; no fr.). Mineral del Monte (*Ehrenberg*, Be; type of *R. brevipes* Meisn.). Hidalgo, wet places near Tula, 2,040 meters (*Pringle* 13180, Wa, Ke, Be, Ko, By). Mt. Orizaba (*Seaton* 365, Ch, G). Chinantla (*Liebmann* 699 E, Ko). Tiuzutlán (*Liebmann* 699, F, Ko).

BERMUDA: Harrington House (*Brown*, Ko).

Subsp. **anodontus** (Hausskn.) Rech. f.

TEXAS: Austin (*Tharp* 1254, Wa). East of Country Club, Austin (*Bogusch* 571, Wa). Tarrant Co., moist ground (*Ruth* 1185, Wa).

43. **Rumex dentatus** L. ssp. **Klotzschianus** (Meisn.) Rech. f.

See Vorarb. 1: 19. Native of southern and eastern Asia. Introduced to America.

OREGON: Albina, Portland (*Suksdorf* 2761, 2843, 2906, P). Linnton, Portland (*Suksdorf* 1898, P). Multnomah Co. (*Suksdorf* 2952, P).

CALIFORNIA: Stockton, San Joaquin Co. (*B. Davy* 1195, Ca).

44. **Rumex violascens** Rech. f. Figure 23

Planta annua vel biennis (vel interdum perennans). Caulis validus rarius gracilis ad 80 cm. altus in parte inferiore stricte erectus in parte superiore ± flexuosus tota longitudine canaliculato-sulcatus, saepe purpureo-suffusus, a medio (rarius iam infra) ramosus et florifer. Rami plerumque breves, arcuato-divergentes, a caule angulo ca. 45°–60° abeuntes, paniculam parvam apertam formantes. Ochreae albidae vel bruneae hyalinae. Folia omnia in vivo ut videtur subcarnosa in sicco crasse membranacea vel subcoriacea, plana vel margine crispula, glaberrima, ut tota planta levia. Nervi laterales foliorum a mediano angulo 45°–60° abeuntes. Folia basalia obverse lanceolata vel elongato-obovata, latitudine 2–4-plo longiora, supra medium plerumque latissima, supra basin saepe paulo panduriformi-constricta, basi late cuneata vel truncata, apice obtusa vel acutiuscula. Petiolus crassiusculus ad summum dimidiam longitudinem laminae aequans. Folia caulina inferiora et media basalibus similia sed minora et proportione angustiora et longiora et brevius petiolata. Folia summa parva anguste lanceolata utrinque angustata

breviter petiolata. Florum glomeruli plurimi remoti summi tantum in statu fructifero contigui, infimi tantum folio suffulti. Perigoniorum fructiferorum pedicelli validiusculi valvis aequilongi vel saepius 1.5 (–2) -plo longiores, prope basin incrassato-articulati, ab articulatione basin perigonii versus paulo dilatati ibique subinflato-incrassati. Perigonii foliola exteriora anguste lanceolata acuta, vix 1 mm. longa, basibus interiorum appressa. Perigonii folia interiora (valvae) in statu fructifero 2.5–3 mm. longa, 2–3 mm. lata, ambitu deltoidea vel triangulari-lingulata, apice acuta, margine basin versus utrinque irregulariter acute pluridentata, rarius subintegra. Valvae facie scrobiculato-nervosae, reticulo nervaturae valde prominente irregulari apicem valvae versus saepe ± evanescente. Valvae omnes calliferae; calli ± inaequales, maior 1.5–2 mm. longus, ± 0.75 mm. latus, ovatus, prominens, apice acute in nervum medianum valvae transiens, sub lente minute impresse punctulatus, interdum insuper transverse rugulosus. Nux brunea, 1.7 mm. longa, ± 1.2 mm. lata, vix infra medium latissima.

SYNONYMY: *R. violascens* Rech. f. Repert. Sp. Nov. 39: 171. 1936. *R. Berlandieri* Trelease 89. 1892; Small 370. 1903; Jepson 292. 1923; omnes saltem pro maiore parte, non Meisn.

ILLUSTRATION: Trelease 1892, *pl. 27* (only the fruiting branch and the left-hand leaf, as *R. Berlandieri*).

DISTRIBUTION: Western United States from California to Texas, and in Mexico; in low land, often on ditch banks.

TEXAS: El Paso (*Vasey*, Wa, Le; no fr.). Rio Grande, Presidio del Norte (*Havard* 111, Wa). Rio Grande Valley at Canutillo, El Paso Co. (*Barlow*, Ch).

NEW MEXICO: On the Rio Grande near Frontera (*Wright* 1780, 1781, Wa, Be). Valley of Rio Grande below Dona Ana (*Parry, Bigelow, Wright & Schott* 1173, Wa). Las Cruces (*Wooton*, Wa).

ARIZONA: Tucson (*Toumey* 342, 343a, Wa, Ca; *Evans*, SL). Phoenix (*Toumey* 343b, Wa; *Dewey*, Wa). Colorado Valley (*Palmer* 638, Wa, SL, Ch; no fr.). Catalpa (*McDougal* 751, Wa).

CALIFORNIA: Delano, Kern Co. (*B. Davy* 2430, Ca). Kern Delta (*B. Davy* 2146, Ca). Mesquite Lake, near Imperial, Colorado Desert (*B. Davy* 8024, Ca). Cameron Lake, Colorado Desert (*Brandegee*, Ca). Holtville, Imperial Valley (*Parish* 8078, La, Ca). Blue Lake, Imperial Valley (*Abrams* 3193, SL). Garner's Laguna (*Schoenfeldt* 2906, Wa). San Joaquin River, Lathrop (*Suksdorf* 53, P). "California, Arizona, etc." (*Palmer* 635 or 630, Be).

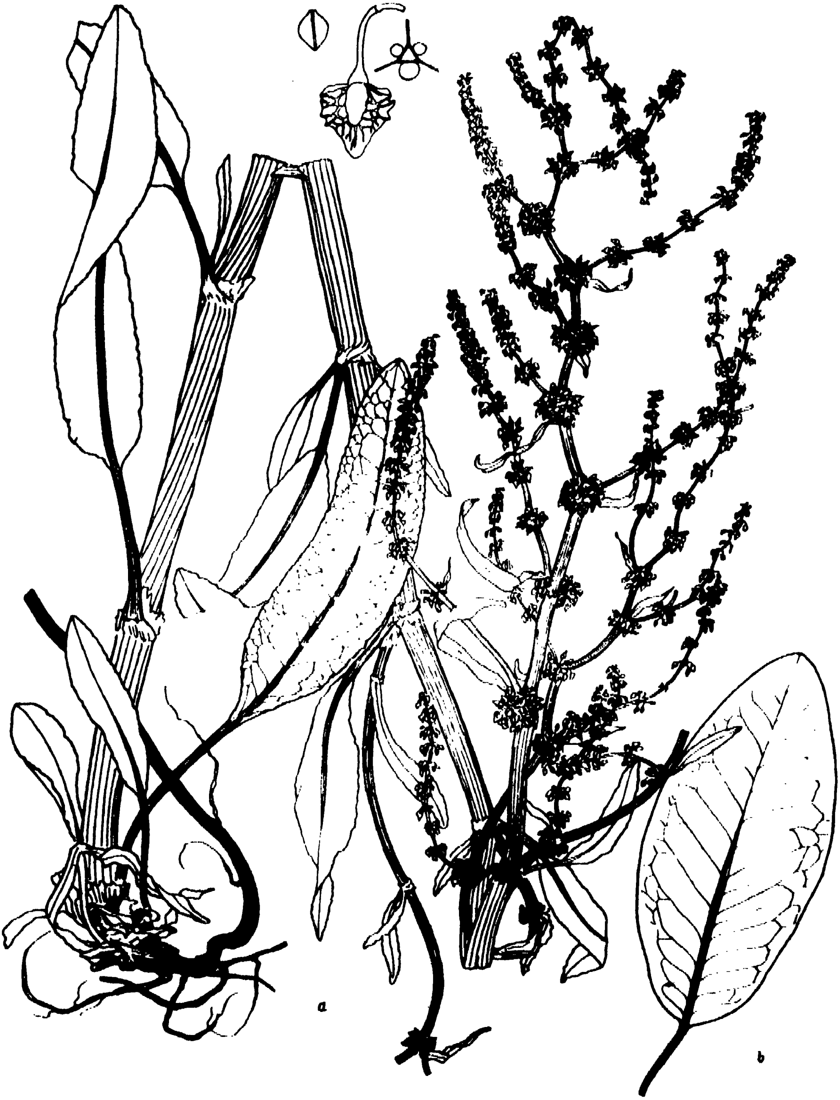


FIG. 23. *Rumex violascens* Rech. f.

MEXICO: San Lorenzo de Laguna and vicinity, 22–27 leagues southwest of Parras, Coahuila (*Palmer* 1182, Wa, UW, Paris; no fr.). Hermosillo, bed of Río de Sonora (*Maltby* 203, Wa; *Rose, Standley & Russell* 12463, Wa; dwarf specimen).

CULTIVATED: California, Berkeley (?, Ca).

INTRODUCED: Denmark: Amager, Paa Falleden (*Wiinstedt*, Ko).

This species has been identified by most American authors with *R. Berlandieri* Meisn. I consulted Meisner's type in the Berlin Herbarium, and pointed out that *R. Berlandieri* is not identical with the plant described here, but belongs to the subsection *Salicifolii*. *R. violascens*, on the contrary, is next related to *R. paraguayensis* Parodi; see Rech. f. Vorarb. 3: 33. As to the differences between *R. Berlandieri* and *R. violascens*, see the remarks under *R. Berlandieri*. The variability of *R. violascens* with regard to shape and breadth of leaves and outline and degree of denticulation of the valves is important, but since several characters never occur together, there is no reason to distinguish varieties.

Explanation of Figure 23.—*Rumex violascens* Rech. f., half natural size: (*a*) habit, Mexico, *Parry* 1173; (*b*) basal leaf, Arizona, *MacDougal* 751. Valves 4 times natural size, Arizona, *Dewey*.

45. **Rumex flexicaulis** Rech. f. Figure 24

Annuus vel biennis. Caules plerumque plures, ± graciles, flexuosi, e basi procumbente ascendentes, fistulosi, flavescentes vel brunnescentes, profunde sulcati, humiles, 15–40 cm. alti saepe iam infra medium ramosi et fructiferi, rami angulo acuto arcuato-divergentes, singuli simplices vel infimi iterum ramosi. Caules rami petioli folia subtus ad nervos papillis minutis albidis diu persistentibus, rarius evanescentibus obsiti. Ochreae bruneae membranaceae maiusculae. Folia omnia in sicco tenuiter membranacea, plana, nervi secundarii angulo 40°–60° a primario abeuntes. Folia basalia ignota. Folia caulina inferiora oblongo-lanceolata, basi subcordata vel ± late cuneato-contracta, apice acuta, latitudine 4–5-plo longiora. Petiolus latitudinem folii circiter aequans. Folia caulina media et superiora sensim minora angustiora basi magis angustata brevius petiolata. Panicula fructifera aperta, florum glomeruli multiflori, inferiores remoti, superiores contigui et valde compacti, omnes fere folio suffulti. Perigoniorum fructiferorum pedicelli validiusculi, prope basin articulati, ad basin perigonii subito inflato-dilatati, perigonio maturo plerumque evidenter breviores. Perigonii foliola exteriora lineari-lanceolata 1.3–1.5 mm. longa apice acuta basibus

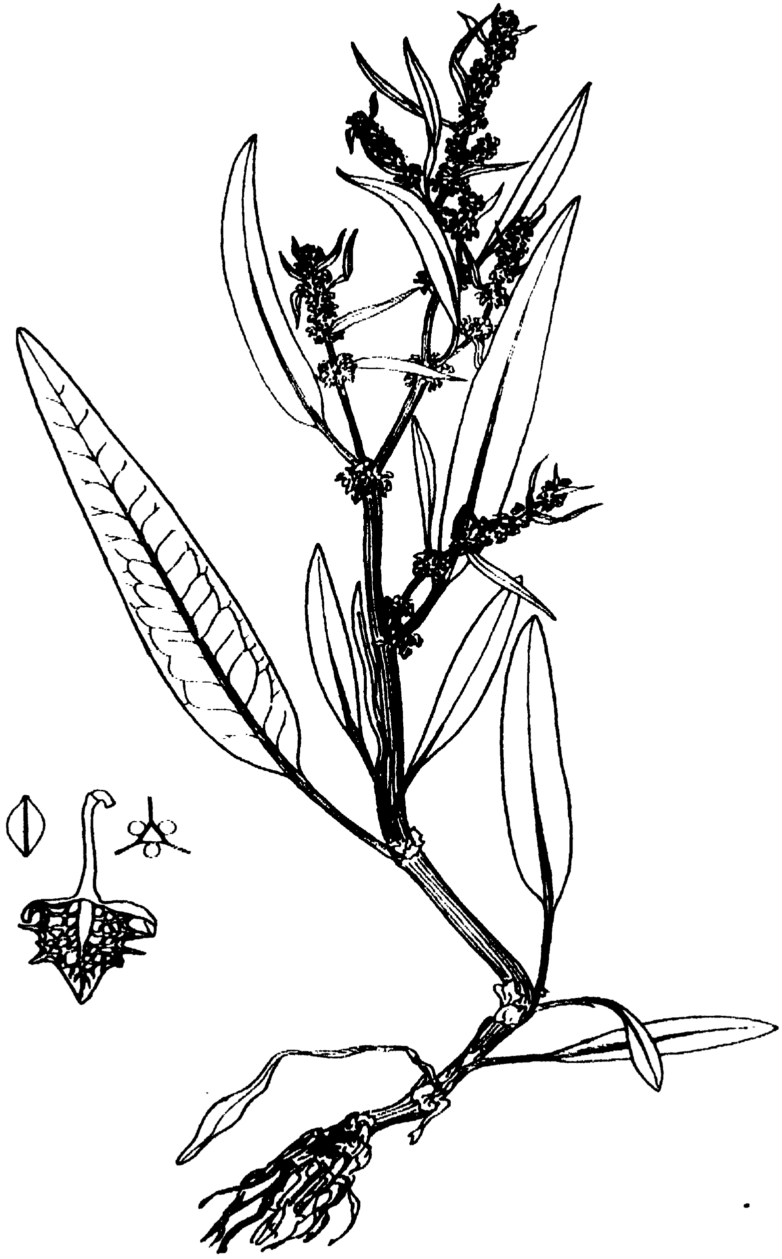


FIG. 24. *Rumex flexicaulis* Rech. f.

interiorum appressa. Perigonii folia interiora (valvae) in statu maturo 3–3.5 mm. longa, 2.2–2.9 mm. lata, consistentia coriaceo-membranacea, colore atrobruneo-rufescenti, ambitu triangularia, basi truncata, apice in linguam acutiusculam protracta, margine basin versus utrinque 2–3 (–4) -dentata. Dentes parvi acuti irregulares 0.5 mm. (raro ad 1 mm.) longi. Valvae facie distincte reticulato-nervosae omnes subaequaliter calliferae; calli 1.2–1.6 mm. longi, 0.3–0.4 mm. lati, valde prominentes, anguste fusiformes, apice sensim in nervum medianum transientes, facie minute impresse cellulato-punctati. Nux matura brunea ± 2 mm. longa, ± 1 mm. lata, infra medium latissima, basi subbrevius, apice longius acuminata.

SYNONYMY: *R. flexicaulis* Rech. f. Repert. Sp. Nov. 39: 172. 1936.

MEXICO: Valley of Mexico, 2,190 meters (*Pringle* 9612, Wa). Bord des fossées près Mexico (*Bourgeau* 200, Ke). Chapultepec, auf feuchten Feldern (*Schaffner*, Ke). Without locality (*Schmitz*, MW; no fr.). Mexico City (*Orcutt*, 4073, Ch).

Specimens of this species have been distributed under the name *R. maritimus* L. *R. flexicaulis* is very distinct from the American and all the other representatives of the *Maritimi* by its broad leaves, large fruiting perigonia with short teeth, and large nutlets.

Explanation of Figure 24.—*Rumex flexicaulis* Rech. f.; half natural size; Mexico, *Schmitz*. Valves 4 times natural size; Mexico, *Bourgeau* 200.

46. **Rumex fueginus** Philippi. Figure 22, *c–g*

Annuus vel interdum biennis (aut perennans?). Caulis erectus vel adscendens, 15–60 cm. altus, strictus vel angulato-flexuosus, gracilis vel validus, subfistulosus brunnescens interdum purpurascens, ± tenuiter sulcato-striatus, papilloso-scaber glabrescens vel glaber, a medio vel a basi ramos fructiferos emittens. Rami angulo ca. 45° arcuato-ascendentes vel erecti, inferiores saepe elongati et iterum ramosi superiores ± abbreviati simplices. Ochreae albido-bruneae cito evanescentes. Folia omnia in sicco tenuiter vel crasse membranacea vel subcoriacea, nervis secundariis angulo ca. 60° a primario abeuntibus, margine ± undulato-crispa, glabra vel saepius—imprimis subtus ad nervos—pubescenti-scabra. Folia basalia lineari-lanceolata, basi leviter cordata vel truncata, supra basin saepe dilatata vel paulum panduriformi-constricta, apice acutiuscula, latitudine 5–7-plo longiora, petiolata; petiolus lamina brevior. Folia caulina media basalibus similia sed brevius petiolata, petiolus latitudinem laminae ± aequans. Folia caulina superiora angustissime linearia subplana basi cuneata. Panicula fructifera ampla aperta in speciminibus macris interdum compacta. Florum glomeruli multiflori infimi tantum remoti superiores contigui, in statu fructifero saepe valde compacti, omnes folio suffulti. Perigoniorum fructiferorum pedicelli tenuissime setacei, prope basin tenuiter annulato-articulati, basin perigonii versus sensim paulum dilatati, perigonio maturo 1 2-plo longiores. Perigonii foliola exteriora anguste lanceolato-linearia, ca. 1 mm. longa, basibus interiorum appressa, apice acuta, saepe aliquantum recurva. Perigonii folia interiora (valvae) 1.7–2 mm. longa (apice incluso), 0.7–0.9 mm. lata (dentibus exceptis), subcoriaceo-membranacea, apice in linguam angustissimam acutam excurrentes, margine utrinque in dentes 2 e basi dilatata setaceo-subulatos tenuissimos divergentes, latitudinem valvae plerumque superantes fissa, facies angusta tota fere callo occupata nervatura itaque vix conspicua in dentes apicemque excurrens. Valvae omnes subaequaliter calliferae, calli ca. 1 mm. longi latitudine ca. 3-plo longiores valde prominentes apice obtusiusculi, facie tenuissime cellulato-punctati. Nux matura brunea, 1.3–1.4 mm. longa, 0.5–0.7 mm. lata, utrinque subaequaliter acuminata in medio circiter latissima.

SYNONYMY: *R. fueginus* Philippi, Anal. Univ. Chile 91: 493. 1895; Rech. f. Vorarb. 3: 35. 1935. *R. maritimus* L. var. *fueginus* Dusén, Sv. Exped. Magell. 3, No. 5: 194. 1900; St. John, Rhodora 17: 76. 1915. *R. maritimus* Meisn. apud DC. 59. 1856, p.p., non L.; Wats. 9. 1880; Coulter 318. 1885; Macoun 417. 1883; Rydb. R. 232. 1922, non L. *R. persicarioides* Pursh 248. 1816; Campdera 79. 1819; Hook. 130. 1896; Meisn. apud DC. 59. 1856; Trelease 93. 1892, Britt. & Brown 552. 1896; Small 371. 1903; Piper 226. 1906; Gray 357. 1908; Woot. & Standl. 193. 1915; Jepson 293. 1923; Tidestrom 760. 1925; Rydb. P. 280. 1932, non L.

ILLUSTRATIONS: Rhodora 17: *pl. 113.* 1915 (*R. maritimus* var. *fueginus*); Trelease 1892, *pl. 32* (as *R. persicarioides*); Britt. & Brown 552. 1896 (bad; as *R. persicarioides*).

DISTRIBUTION: Southern parts of South America and Andes of Ecuador; Canada; United States (southeastern states excepted).—Imperfectly developed Canadian specimens collected by ·Marie-Victorin and Rolland-Germain could, because the shape of the leaves is the same in both species, belong as well to *R. persicarioides* L.

PRINCE EDWARD ISLAND: Queen's Co., border of salt marsh, Bunbury (*Fernald, Long & St. John* 7340, Wa).

NOVA SCOTIA: Lagoon, Sable Island (*Macoun* 22594, Ch).

QUEBEC: Lac Constance (*Rolland* 10075, Ch, Wa). Ile d'Anticosti, Rivière La Loutre (Est), sur sable en marge du goulet (*Marie-Victorin & Rolland-Germain* 27231, Wa, St; 27284, Wa). Magdalen Isl., wet sands or mud at margins of brackish ponds southwest of Etang du Nord village, Grindstone Isl. (*Fernald, Long & St. John* 7339, O, Wa). Ile de l'Etang du Nord, Lagune de l'Etang du Nord (*Marie-Victorin & Rolland-Germain* 9768, Ch). Vallée de l'Ottawa, Lac Deschênes (*Rolland* 13016, Wa).

ALBERTA: Damp earth, ditch side, Craigmyle (*Brinkman* 786, Ch; 787, Wa). Border of marsh, north side of Bow River, Calgary (*Moodie*, Ch, Wa). Bow River, 1,350 meters, Actin Village (*Setchell & Parks*, Ca; dwarf specimen). Silver City (*Macoun* 23742, Ch). Banff (*McCalla* 2399, Wa).

SASKATCHEWAN: Prince Albert, Lat. 58° (*Macoun* 12914, Ch).

BRITISH COLUMBIA: Vancouver Island, Alberni Canal (*Macoun*, Wa). Nanaimo (*Macoun* 83930, Ch; approaching var. *tanythrix*).

RHODE ISLAND: Shores of Watch Hill Pond, Watch Hill (*Setchell*, Ca; approaching var. *tanythrix*).

WISCONSIN: Dry marsh, Delavan (*Hollister* 143, Wa). Silver Lake, Elkhorn, Walworth Co. (*Hotchkiss & Martin* 4399, UW; dwarf specimen).

ILLINOIS: Chicago, Stony Island (*Greenman* 2805, Wa; approaching var. *tanythrix*).

MINNESOTA: Fort Snelling, bank of Mississippi River (*Mearns*, Ch, Wa). Swan Lake, Nicollet Co. (*Metcalfe* 47, Wa). Shores, Sandy Lake (*Sandberg* 767, Wa). Itasca Co. (*Sandberg*, Ch). Ash Lake, Lincoln Co. (*Metcalfe* 1716, Wa). Tait Lake, Kandiyohi Co. (*Metcalfe* 2022, Wa). Anthony Park (*Schuette*, Ch). Geneva Lake, Freeborn Co. (*Shunk & Manning* 17, MW).

IOWA: Mud Lake (*Hitchcock*, Ca). Iowa Lakeside Laboratory, Lake Okoboji, Dickinson Co., along canal (*Conard*, MW).

MISSOURI: Without locality (*Bush* 8240, NY). St. Louis (*Engelmann*, St). St. Louis, bords du Mississippi (*Riehl* 464, MW). Missouri River, below Dampshire Rapids (*Ward*, Wa). Independence (*Bush* 58, Ca). Courtney, sandy bottoms (*Bush* 8240, Wa; 8240A, Ca; 8922, Ch).

ARKANSAS: Little Rock, sandy flood plain of Arkansas River west of Iron Mt. R. R. bridge (*Coville* 66, Wa).

NORTH DAKOTA: Mud Lake, Hankinson (*Metcalfe* 146, Wa). Leeds, Benson Co. (*Lunell*, Ch, Wa; partly *tanythrix*). Dickson (*Holgate*, Wa; approaching var. *tanythrix*). Lake Velva (*Mabbott* 444, Wa; *tanythrix*).

SOUTH DAKOTA: Iroquois (*Thornber*, Ca). Sandy beach of Missouri River near White River (*Geyer* 137, Wa). Cheyenne River (?, MW).

NEBRASKA: Red Willow Lake (*Thomson* 341, Wa; approaching *tanythrix*). Ballard Lake (*Thomson* 196, Wa). Middle Loup River, near Mullen, Hooker Co., rich meadow (*Rydberg* 1572). Pishelville, Knox Co. (*Clements* 2264, Wa). Wet places, Ashland (*Williams* Wa; partly approaching *tanythrix*). Crawford (*Webber*, Wa).

KANSAS: Manhattan (*Carleton*, Wa). Great Bend (*Benke* 5133, Ca, Ch). Stream banks, Riley Co. (*Pond* 1143, Wa). Bottomlands of Arkansas River south of Kendall (*Rydberg & Imler* 1003, NY).

MONTANA: Vicinity of Bozeman, wet ground (*Blankinship* 453, St, Wa). Harlowton (*Wooton*, Wa). Townsend (*Shear* 5238, Wa). Mountains south of Virginia City (*Allen ?*, Wa; *brachythrix*). Dried-up pool, Glacier Park Station, 1,440–1,530 meters (*Standley* 17663, Wa). Without locality (*Anderson*, Wa; *tanythrix*).

WYOMING: Damp soil along Buffalo River (*Merrill & Wilcox* 1176, Wa; *brachythrix*). Platte Canyon (*A. Nelson* 2757, St). Hutton Lake (*A. Nelson* 5290, Ca). Kendall, Sublette Co., margin of pond (*Payson* 2932, Wa, Ca). Yellowstone Park (*Mearns* 3497, Wa). Yellowstone Park, Turbid Lake (*Tweedy* 24, Wa). Shores of Two Ocean Lake, Teton Co. (*Williams* 1648, P). Yellowstone Park, in cacumine Electric Peak (*Enander*, St).

COLORADO: Denver, Sloan's Lake (*Eastwood* 105, Wa, Ca). Ft. Lupton, in swamp (*Johnston* 848, Wa). San Luis Valley, 1,920 meters (*J. Wolf* 1010[32], Wa; *brachythrix*). Texas Creek, 2,100 meters (*Brandegee*, Ca). Pueblo, Fremont Co. (*Brandegee* 947, Ca).

NEW MEXICO: Mangas Springs (*Wooton*, Ca; *Metcalfe*, Wa; *brachythrix*). Along ditches, Navajo Indian Reservation, Shiprock Agency, 1,425 meters (*Standley* 7262, Wa). Marsh, Jicarilla Apache Reservation near Dulce, 2,150–2,470 meters (*Standley* 8159, Wa). Gila (*Wooton*, Wa). Along ditch, Farmington, San Juan Co., 1,550–1,650 meters (*Standley* 6879, Wa; *brachythrix*). Mountains southeast of Patterson (*Wooton*, Wa; approaching *brachythrix*).

WASHINGTON: Spokane Co., Philleo Lake (*Suksdorf* 943, Wa, Ca). Spokane and Stevens Co., Mission (*Kreager* 484, 500, P, Wa). Little Spokane River, Dartford (*St. John* 9682, P). West Medical

Lake (*St. John* 6765, P). Whitman Co., Rock Creek above Rock Lake (*St. John & Warren* 6774, P; *Lake & Hull* 652, P). Revere (*St. John, etc.* 7143, P). Granite Point, Wawawai (*St. John* 3383, P). Snake River, Wawawai (*St. John* 6736, P). Southeast of Lamont (*Lackey*, P). *Typha* swamp northeast of Ewan, Whitman Co. (*Dillon, Pickett & Clarke* 349, P). Okanogan Co., Conconully (*St. John* 7741, P). Between Loomis and Tonasket (*Thompson* 7101, SL). Ophir (*Elmer*, P). Alma (*Elmer*, P). Beach at Golden Gardens, Seattle (*Thompson* 5123, SL; *tanythrix;* leaves with cuneate base). Coulee City (*Henderson*, P). Southland (*Spillman*, P). Clallam Co. (*Elmer* 2684, P). Bingen, Klickitat Co. (*Suksdorf* 11804, P). Whidbey Island (*Gardner* 256, P). Douglas Co., Egbert Springs (*Sandberg & Leiberg* 411, Wa, Ca). Alkali Lake, 330 meters (*Sandberg & Leiberg* 41, P).

OREGON: Deschutes Co., Crooked River near Smith Rock (*Whited* 416, P). Crooked River between Trail Crossing and Oregon (*Whited* 541, P). Portland (*Gorman* 3677, P). Silver Lake (*Henderson* 2423, P). Beach, Seal Rocks, Lincoln Co. (*Peck* 10695, Ch; fruits very small). "The Meadows," Wallowa Co., 1,275 meters, near spring on deserted ranch (*Sheldon* 8718, Wa, NY; *tanythrix*). Klamath Indian Reservation, Klamath Lake, near Modoc Point (*Coville* 1334, Wa). Upper Klamath Lake, 1,440 meters (*Leiberg* 711, Wa). Klamath Falls, Lake Ewana (*Lawrence* 1189, Wa).

IDAHO: St. Anthony (*Merrill* 482, Wa). Wet soil along irrigating ditch, St. Anthony (*Merrill & Wilcox* 1185, Wa; *brachythrix*). Falk's Store, Canyon Co. (*Macbride* 310, Wa, P, Ca). Granite Station, Kootenai Co. (*Sandberg, etc.* 778, Wa). Coeur d'Alene Mts., low meadows, Blue Creek, 750 meters (*Leiberg* 1326, Ca, Wa). Fernan Lake shore, Coeur d'Alene Mts. (*J. Rust*, Wa). Shores of Lake Pend d'Oreille (?, 559, Ca).

NEVADA: Carson Lake (*Tidestrom* 10776, Wa; *athrix*). Coleman Valley, 1,375 meters (*Coville & Leiberg* 109, Wa; *brachythrix*). Along beach, Walker Lake, near Hawthorn (*Tidestrom* 10148, Wa). Ruby Valley near Cave Creek, Elko Co., 1,800 meters (*Heller* 9526, Wa). Roadside, moderately dry, Battle Mt., 1,350 meters (*Hitchcock* 600, Wa; approaching *brachythrix*). Pah-Ute Mts., 1,500 meters (*Watson* 1052, Wa; *athrix*). Northwestern Nevada (*Bailey* 1053, Wa). Humboldt River, "au dessous des lacs" (*Rémy*, Paris; *athrix*).

UTAH: Vermillion, 1,620 meters (*Jones* 5839, Wa, Ca; *athrix*). Salt Lake City, 1,290 meters (*Jones* 1064, MW, Wa; *brachythrix*). Salt Lake Valley, 1,350 meters (*Watson* 1053, Wa; approaching *brachythrix*). Rabbit Valley, 2,010 meters (*Ward* 598, Wa; partly *athrix*). Panguitch Lake, 2,520 meters (*Jones* 6015ax, 6002an).

ARIZONA: Road between Springerville and Fort Apache, Apache Co., 2,120–2,800 meters (*Eggleston* 15755, Wa; *brachythrix*).

CALIFORNIA: Humboldt Co., Stone Lagoon, marshy ground (*Tracy* 5867, Ca; partly *tanythrix*). Lassen Co., Willow Creek (*Baker & Nutting*, Ca). Siskiyou Co., saline flat, Butte Valley, 1,260 meters (*Butler* 1877, Wa, Ca; *brachythrix*). Lake shore (*Austin & Bruce* 2273, Ca). Fall River Lake, Shasta Co. (*Baker*, Ca). Castroville, Moss Landing, Monterey Co. (*Abrams* 4079, Ca). Shores of Clear Lake, Lake Co. (*Jepson*, Ca). Cache Creek, Lake Co. (*Bolander* 2261, Wa). San Francisco (*B. Davy* 1162, Ca; approaching *tanythrix*). San Francisco, "ad lacum Nuphar" (?, MW). San Francisco Co., Presidio (*Michener & Bioletti*, Wa). San Francisco, Lake Merced (*Rose*, Br; *tanythrix*). Puget Sound and San Francisco (*Capt. Wilkes* "1508," Wa). San Mateo Co., Crystal Springs (*Elmer* 4131, Wa). Laguna Canyon, frequent at edge of ponds (*Munz* 6346, Ca). Laguna, border of pond (*Munz* 2197, Ca). Laguna Canyon, lake shore (*Crawford*, Ca, SL). Los Angeles Co., Nigger Slough (*Braunton* 507, Ca, Wa). Los Angeles (*Brewer* 27, Wa; *brachythrix*). Bear Valley, San Bernardino Mts. and their eastern base, 1,950 meters (*Parish* 3059, Wa; 1508, Wa, Ca; *brachythrix*). Wet shore, Bear Lake, San Bernardino Co., 1,990 meters (*Munz* 10547, Ca). Mountain Lake (*Greene*, Wa; *tanythrix*). San Luis Rey (*Parry*, Wa; *tanythrix*). Hemet Dam (*Wilder* 794, Ca; partly approaching *brachythrix*). Wet places by Lake Merced (*Rose*, MW). Goose Lake Valley (*Austin* 159, Wa). Guadalupe (*Condit*, Ca). Oxnard, Ventura Co. (*B. Davy* 7804, Ca; *ovato-cordatus*). Without locality (*Frémont's Exped.* 426, Wa).

ECUADOR: In solo salso prope Salinas, Prov. Ibarra (*Sodiro*, Bu).

St. John has treated carefully the North American representatives of the *Maritimi* in Rhodora 17: 73. 1915. He comes to the following conclusions:

(1) The name *R. persicarioides* L. is very probably not to be applied to the most common North American plant as was done by Trelease and subsequent authors, but to a type limited to salt marshes and saline shores along the lower St. Lawrence and Richelieu rivers, characterized by the swollen, elliptic-ovate, straw-colored grains, not narrowed into the midrib of the valve.

(2) The most common North American type, with usually somewhat curled leaves, truncate or slightly truncate at the base, mostly named *R. persicarioides* since Trelease, is identical with the South American *R. fueginus* Philippi. As there are no remarkable differences in leaves and fruits between this plant and the Eurasian *R. maritimus* L., St. John calls the common American plant *R. maritimus* var. *fueginus*, as Dusén did.

(3) In the drier parts of the western United States occurs a form of *R. fueginus* differing from the type by the reduction or the complete lack of teeth on the margin of the valves. St. John calls this type *R. maritimus* var. *athrix*.

(4) The Eurasian *R. maritimus* with plane (not curled) leaves, cuneate at the base, has been found twice in the United States as an introduction.

(5) *R. crispatulus* Michx., by Trelease taken as a synonym of his *R. persicarioides*, is *R. obtusifolius* L. according to Fernald, who examined the type specimens (Fernald apud St. John, op. cit. 77).

The Gray Herbarium kindly lent me some specimens named by St. John as *R. persicarioides*, which I have compared with more than 150 sheets of *R. fueginus* from all parts of North America, and I can confirm his conclusions. In the reddish-brown color of the whole plant, especially of the fruiting perigonia, *R. persicarioides* agrees completely with *R. fueginus*. The length of the teeth of the valves is variable in both species, but in *R. fueginus* much more so than in *R. persicarioides*. This character, therefore, can not be considered diagnostic, as St. John believed, so the grain character remains the only distinction, since I could not find any differences in the vegetative parts. Nevertheless, I consider that this single character together with the geographic distribution is sufficient to maintain the two types as species.

I also agree with St. John in stating that the common North American type is identical with the South American. Slight differences in the length of the inner perigonium segments—those of the South American plants are usually somewhat longer—may be neglected. The occurrence of *R. fueginus* in Ecuador, recently pointed out by me (see note on page 137), suggests a link between the two remote parts of the area of *R. fueginus*. More localities for *R. fueginus* may still be found in the Andes.

I can not agree with St. John's taxonomic concept of *R. fueginus* as a variety of *R. maritimus*. The differences between *R. maritimus* and *R. fueginus* in the papillosity and shape of the leaves, and in the color of the ripe fruiting perigonia, together with the existing but not tangible differences in the outline of the valves and with the geographical distribution, make a specific distinction necessary between *R. maritimus* and *R. fueginus.* There can be no doubt that *R. fueginus* is much more nearly related to *R. persicarioides* than to *R. maritimus.*

The variability of *R. fueginus,* in regard to habit, shape and texture of leaves, size of valves, and length of teeth, is considerable in both parts of the area, but greater in the northern one. In swamps the lower parts of the stem are often somewhat swollen or the stem is procumbent or ascending. Dwarf forms seem to occur on humid sand. In shady situations the whole plant becomes weak and tender. Some of the South American specimens show strongly curled leaves and more distinct papillosity of the vegetative parts. But no combinations of characters are fixed or limited to certain regions, so that the following varieties, very striking in extreme cases but connected by transitional forms, have but little taxonomic significance, except perhaps var. *athrix.*

Var. **athrix** (St. John) Rech. f.—*R. maritimus* var. *athrix* St. John; Tidestrom 160. 1925. Valvis integris.

Var. **brachythrix** Rech. f.—Valvarum dentes latitudinem valvae vix superantes; valvae et nuces saepe minores quam in typo.

Var. **typicus** Rech. f.—Valvarum dentes latitudinem valvae circiter 1.5–2.5-plo superantes.

Var. **tanythrix** Rech. f.—Valvarum dentes latitudinem valvae 3–4-plo superantes.

To the above it seems necessary to add a peculiar-looking plant, which I designate at present as var. **ovato-cordatus** Rech. f.: Differt a typo foliis caulinis inferioribus e basi leviter cordata late ovatis acutis, nervis secundariis angulo 70°–80° a primario abeuntibus, latitudine vix 1–1.5-plo longioribus. I saw only one sheet: California, Oxnard, Ventura Co. (*B. Davy* 7804). In the list of specimens examined the names of the varieties are added.

Explanation of Figure 22, c–g.—Valves 4 times natural size: (*c*) ***Rumex fueginus*** var. ***athrix*** (St. John) Rech. f., from ***Jones*** 5839; (*d*) var. *brachythrix* Rech. f., *Butler* 1877; (*e*) var. *ovato-cordatus* Rech. f., *Davy* 7804 (a basal leaf added); (*f*) var. *tanythrix*

Rech. f., *Sheldon* 8718; (*g*) a form with extremely small fruits, Leeds, North Dakota, *Lunell*.

47. **Rumex persicarioides** L. Figure 25

Planta annua. Caulis erectus, 10–50 cm. altus, strictus vel anguloso-flexuosus, gracilescens, fistulosus, tenuiter sulcato-striatus minute pubescenti-scaber, rufo-bruneus, a medio vel iam infra ramosus et fructifer. Rami fructiferi angulo ± 45° a caule abeuntes arcuato-divergentes, singuli, inferiores ± elongati iterum ramosi, superiores breves simplices. Ochreae parvae membranaceae cito evanescentes. Folia basalia e basi truncata vel subcordata lineari- vel oblongo-lanceolata. Folia caulina inferiora basi late cuneata vel truncata vel interdum subcordata basalibus similia, consistentia in sicco ± tenuiter membranacea, margine ± crispato-undata, apice acuta, latitudine 5–7-plo longiora, nervis secundariis angulo 45°–60° a mediano abeuntibus, imprimis subtus tenuiter pubescenti-scabra, petiolata. Petiolus latitudinem folii aequans vel interdum superans. Panicula fructifera ampla aperta. Florum glomeruli multiflori infimi remoti, superiores valde approximati in statu fructifero contigui, omnes folio suffulti sed folia apicem ramorum versus valde diminuta et vix prominentia. Perigoniorum fructiferorum pedicelli tenuiter filiformes, prope basin annulato-articulati, basin perigonii versus sensim paulum dilatati, perigonio maturo 1.5-plo longiores. Perigonii foliola exteriora anguste lanceolato-linearia, 1 mm. longa, basibus interiorum appressa, apice acuta. Perigonii folia interiora (valvae) in statu maturo apice incluso 2 mm. longa, dentibus exceptis ca. 1 mm. lata, consistentia subcoriaceo-membranacea, colore intense fusco-brunea, ambitu anguste lingulato-triangularia, basi non dilatata, apice in linguam angustissimam acutam excurrentes, margine utrinque in dentes duo subulato-setaceos tenuissimos elongatos latitudine valvae ca. 2-plo longiores paulum divaricatos fissa, facie reticulato-nervosa, nervis in dentes apicemque excurrentibus. Valvae omnes subaequaliter calliferae, calli ca. 1 mm. longi, prominentes, latitudine ca. 2–3-plo longiores, basi apiceque rotundata, facie tenuissime cellulato-punctati, valvae faciem omnino fere occupantes, colore in sicco aurantiaco. Nux matura brunea ca. 1.1 mm. longa, 0.5–0.6 mm. lata, basi brevius, apice longius acuminata, infra medium latissima.

SYNONYMY: *R. persicarioides* L. Sp. Pl. 335. 1753; St. John, Rhodora 17: 73. 1915; nec aliorum.

ILLUSTRATION: Rhodora 17: *pl. 113*. 1915 (*R. persicarioides*).

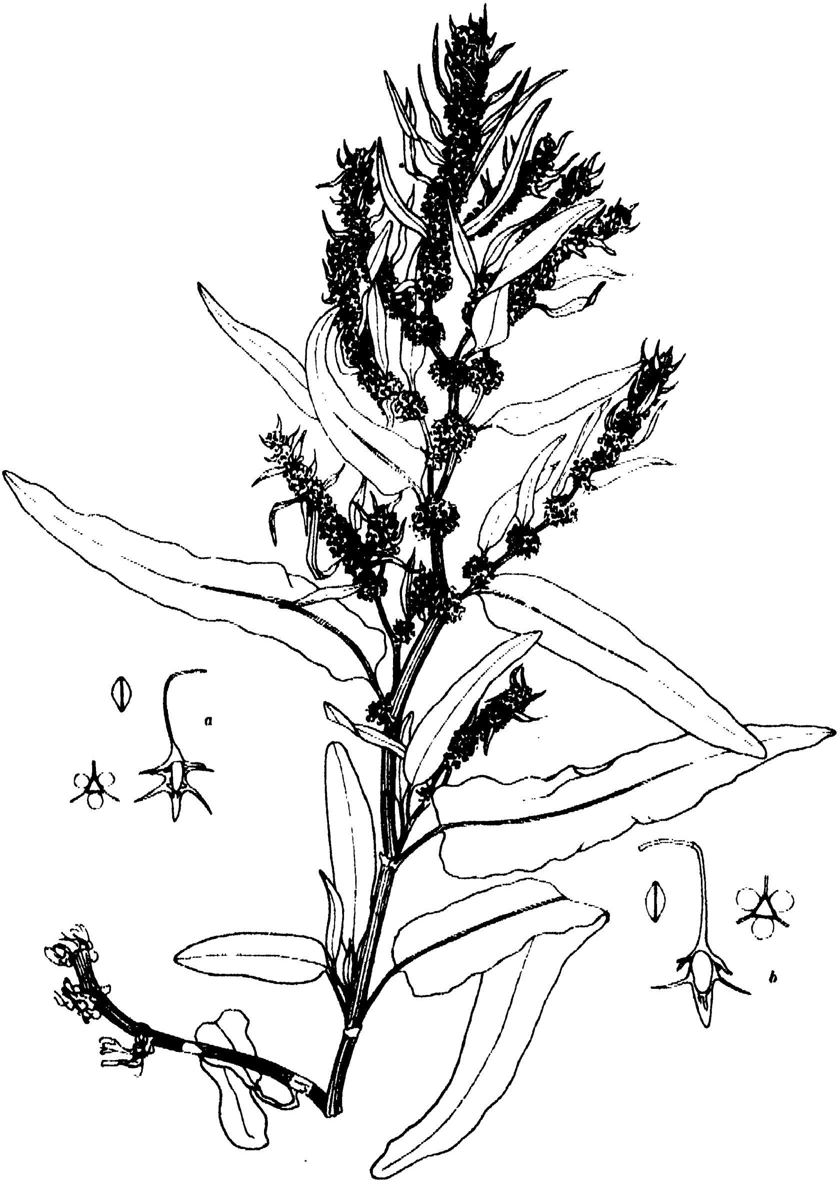


FIG. 25. *Rumex persicarioides* L.

DISTRIBUTION: Eastern Canada, Massachusetts, Oregon, California.

PRINCE EDWARD ISLAND: Prince Co., edge of brackish pond, Malpeque (*Fernald & St. John* 11038, G). Queens Co., border of salt marsh, Bunbury (*Fernald, Long & St. John* 7338, G).

NEW BRUNSWICK: Gloucester Co., wet sand behind beach, Miscou Harbor, Miscou Island (*Blake* 5577, Wa; no fr.).

QUEBEC: Temiscouata Co., Cacouna, margin of salt marsh (*Collins & Fernald*, G). Grèves de St. François de l'ile d'Orléans, près de la Pointe Est (*Marie-Victorin* 15766, G; var. *integerrimus*). Island of the Richelieu, Chambly (*Rolland & Victorin* 562, G). Iles de Madeleine, Grand Etang, Dune du Nord, Ile de la Grande Entrée (*Marie-Victorin & Rolland-Germain* 9769, Wa; no fr.). Bords de la lagune de l'Etang du Nord, Ile de l'Etang du Nord (*Victorin & Rolland-Germain* 9768, Wa; no fr.).

MASSACHUSETTS: Sandy shore and flats at north end of Tashomoo Lake, Tisbury (*Seymour* 1180, Wa, NY; 1462, Ca). Sandy margin, Poncha Pond, Edgartown (*Brooks*, Ca). Gloucester, sandy cove, Bay View (*E. F. Williams*, G).

OREGON: Newport, on sand on beach (*Spillman* 162, P). Beach, Seal Rock, Lincoln Co. (*Peck* 10591, Ch).

CALIFORNIA: Granada, San Mateo Co. (*H. A. Walker* 1539, Ca).

See St. John, loc. cit., for further citations of material.

Rumex persicarioides entirely agrees in vegetative parts with *R. fueginus*, so that flowering specimens from regions where both species are expected to occur can not be named. *R. persicarioides* differs from *R. fueginus* by somewhat narrower valves, rather elliptic (not triangular) in outline, and by thick, swollen grains, obtuse and not narrowed into the midrib. The grain is so large that only a narrow margin of the valve is visible.

Generally *R. persicarioides* is limited to the New England States and southeastern Canada, but St. John told me that he saw in the herbarium of Willamette University, Salem, Oregon, a specimen from Oregon belonging to this species, and I found one from California (*Walker* 1539) that shows the characters of *R. persicarioides* so clearly that I must take it for this species. It is distinguished from the eastern American specimens only by the valves and grains being somewhat larger and the teeth of the valves relatively shorter.

R. persicarioides differs from the Eurasian *R. maritimus*, which occurs in the United States very rarely introduced, by the papillose pubescence of the stems and under side of leaves, by the (at least in dried state) reddish-brown color of the fruiting panicle, by the leaves being shortly contracted and truncate or subcordate at the base, frequently crisped at the margin, and by the large, swollen, rounded callosities occupying the larger part of the valves.

Explanation of Figure 25.—*Rumex persicarioides* L., half natural size; Massachusetts, *Seymour* 1180. Valves 4 times natural size: (*a*) Massachusetts, *Seymour* 1180; (*b*) California, *Walker* 1539.

48. **Rumex maritimus** L.

Very similar to the American *R. fueginus* Philippi, but differing from that by the complete lack of papillosity, the leaves flat and narrowed at the base, by the golden (never reddish-brown) color of the fruiting panicle, and by the shape of the valves.

SYNONYMY: L. Sp. Pl. 335. 1753; Meisn. apud DC. 59. 1856.

Indigenous in Europe and Asia, very seldom introduced to America. I saw only the following specimen:

NEW JERSEY: Hoboken, ballast filling (*A. Brown*, Wa).

49. **Rumex bucephalophorus** L.

Annual or biennial; stem low, usually with some spreading branches, glabrous; leaves small, ovate or lanceolate, cuneate at the base, acutish; pedicels to twice as long as the fruit, finally much thickened toward the base of the perianth and nearly clavate; valves to 2 mm. long, about 1 mm. broad, each of them with a minute callosity and 2–3 teeth on each side.

SYNONYMY: L. Sp. Pl. 336. 1753; Trelease 95. 1892; Small 96. 1903.

Originally from the Mediterranean basin, where it is conspicuously variable. In America found only once as introduced:

LOUISIANA: On ballast ground, Port Eads (*A. B. Langlois* 95).

HYBRIDS

1. **Rumex Britannica** L. × **crispus** L.

R. dissimilis Rech. f.

Differt a *R. Britannica:* Fructibus inaequaliter evolutis maioribus et minoribus mixtis, partim longissime partim brevius pedicellatis, callis inaequalibus partim ovatis, partim elongato-fusiformibus, foliis basalibus minoribus angustioribus subcrispatis.—Differt a *R. crispo:* Fructibus inaequaliter evolutis, valvis partim maioribus margine denticulatis, callis multo longioribus, maculis nervaturae marginalibus partim valde elongatis, folio basali latiore subplano, nervis secundariis angulo fere recto a primario abeuntibus.

SYNONYMY: *R. Britannica* L. × *crispus* L. Repert. Sp. Nov. 40: 300. 1936.

MASSACHUSETTS: Plymouth, in a wet meadow (?, Up).

I have seen only the upper part of a fruiting specimen and one basal leaf. The panicle, because of the unequal size of the fruits and the unequal development of the grains, gives at once the impression of a hybrid. Most of the nutlets are compressible and may never have been viable. By the long pedicels, the orbicular valves, and the grains being at least in part extremely elongate, as well as by the lateral nerves of leaves forming nearly a right angle with the midrib, this plant resembles *R. Britannica.* The other parent species can only be considered a plant with not much shorter pedicels, valves all bearing grains, and shorter, narrower, crisped leaves. These characters are united in none of the indigenous North American species, but are found in *R. crispus.* This plant deserves special attention, as the only wild hybrid of an indigenous North American species.

2. Rumex crispus × obtusifolius

Differing from *R. crispus* by its broader leaves, somewhat cordate at the base, narrower valves with short teeth, and usually more slender habit, and from *R. obtusifolius* by the more or less crisped, narrower leaves and broader valves with shorter teeth. This hybrid is rather common in Europe and occurs also frequently wherever the parents grow together as naturalized. Pollen and fruits are usually sterile in large part. *R. obtusifolius* being represented as adventive mostly by the subsp. *agrestis*, the American specimens of the hybrid mentioned below belong to the combination *R. crispus obtusifolius* subsp. *agrestis*.

SYNONYMY: *R. crispo-obtusifolius* Meisn. apud DC. 54. 1856. *R. crispus* × *obtusifolius* Trelease 92. 1892; Rech. f. Vorarb. I, Beih. Bot. Centralbl. 49, 2: 94. 1932.

NEWFOUNDLAND: Region of Humber Arm, Bay of Islands, Birchy Cove (*Fernald & Wiegand* 3293, NY).

PENNSYLVANIA: (*Rothrock*, Ch).

DISTRICT OF COLUMBIA: Washington, near Potomac Depot (*Ward*, Wa).

OHIO: Mansfield (*Wilkinson*, Wa, Lu).

MICHIGAN: Sault St. Marie (*Harper*, P).

WISCONSIN: Oneida Res., Brown Co. (*Schuette*, Ch).

LOUISIANA: New Orleans (*Drummond* 282).

OREGON: Sauvies Island (*Howell*, Wa).

TEXAS: Huntsville, Walker Co. (*Palmer* 12034, Ca, SL, Br).

CALIFORNIA: Eureka, Humboldt Co. (*Tracy* 2543, Ca). Ferndale (*B. Davy* 6170, Ca). Shasta Co., border of Hatchet Creek, 1,200 meters (*Lyman Benson* 2227, SL).

HAITI: Massif de la Hotte, eastern group, Pt. Goave, Cap St. Michel, 1,000 meters (*Ekman*, Wa).

3. **Rumex crispus × pulcher** (see Rech. f. Vorarb. 1: 82)

BERMUDA: Fields, Warwick Pond (*Britton & Brown* 345, Wa). South Road (*F. S. Collins* 185, Ke, Wa).

VIRGINIA: Near Ocean View Station (*Coville* 3, Ke).

4. **Rumex dumosus × triangulivalvis**

I take from Danser's extensive descriptions the following remarks: "*R. adscendens* differt a *R. dumoso* habitu multo minus insolito, foliis subviridibus basi non dilatatis minusque crispis, ramorum evolutione finita, florum glomerulis partim efoliatis.—Originem e *R. salicifolio* indicant caules parte inferiore levi, folia lanceolata sublevia, absentia foliorum radicaliorum, pedicelli breves paulum incrassati, conspicue articulati et valvae triangulares membranaceae."

SYNONYMY: *R. adscendens* (*R. dumosus* × *salicifolius*) Danser, Nederl. Kruidk. Archief 1925: 470. 1926; Rech. f. Vorarb. 4: 50.

This hybrid grew in the Amsterdam Botanical Garden from seeds of *R. dumosus* which was cultivated in the neighborhood of *R. triangulivalvis*.

5. **Rumex paraguayensis × triangulivalvis**

I take from Danser's extensive description the following remarks: "Haec hybrida parentibus intermedia est et neutri parentis similis est. Habitus, folia radicalis obovata, foliorum margines crispi et racemi maxima pro parte foliati a *R. paraguayensi* veniunt. Folia autem angustiora acuta et, margine crispa excepto, levissima, racemi apice aphylli, valvae maiores, integrae vel fere integrae et color racemorum albidus sunt notae quas a *R. salicifolio* hereditate accepit hybrida."

SYNONYMY: *R. Goethartii* (*R. paraguayensis* × *salicifolius*) Danser, Nederl. Kruidk. Archief 1925: 463. 1926; Rech. f. Vorarb. 3: 51.

Danser obtained this hybrid from seeds of *R. paraguayensis*, which was cultivated in the Amsterdam Botanical Garden in the neighborhood of *R. triangulivalvis*.

AMERICAN SPECIES OF RUMEX NOT IDENTIFIED

Rumex americanus Campd. 151. 1819.

Rumex angustatus Raf. New Fl. N. Amer. 4: 53. 1836.

Rumex Claytoni Campd. 66, 99. 1819. Perhaps a synonym of *R. Britannica* L.

Rumex heterophyllus Raf. New Fl. N. Amer. 4: 52. 1836.

Rumex integrifolius Raf. loc. cit.

Rumex Kunthii Campd. 66, 97. 1819. *R. Kunthianus* Schult. f. Syst. 7: 1423. 1830. *R. longifolius* Kunth apud HBK. Nov. Gen. & Sp. 2: 180. 1817 (non *R. longifolius* DC.). Perhaps a synonym of *R. crispus* L.

Rumex ludovicianus Raf. Fl. Ludov. 30. 1817.

Rumex polygamus Sessé & Moc. Fl. Mex. 97. 1887.

Rumex Schultzii Raf. Med. Repos. N. Y. 5: 353. 1808. Nomen.

Rumex sylvaticus Raf. Amer. Nat. 12. 1820.

TITLES OF LITERATURE CITED

Britton, N. L., and Brown, A.: Illustrated flora of the northern United States, Canada, etc., 1. New York, 1896.

Campdera, F.: Monographie des Rumex, etc. Paris, 1819.

Danser, B. H.: Beitrag zur Kenntnis der Gattung Rumex. 1. *R. salicifolius.* Nederlandsch Kruidkundig Archief 1925: 414–424. 1926.

Gray, A.: Gray's new manual of botany. Seventh ed. New York, 1908.

Hooker, J. D.: Flora Boreali-Americana. London, 1840.

Jepson, W. L.: Manual of the flowering plants of California. 1923.

Macoun, J.: Catalogue of Canadian plants, part 1. Montreal, 1883.

Meisner, K. F., apud DC.: Meisner apud de Candolle, Prodromus systematis naturalis, etc., 14. Paris, 1856.

Michaux, A.: Flora Boreali-Americana. Paris, 1803.

Piper, C. V.: Flora of the State of Washington. Contrib. U. S. Nat. Herb., 11. Washington, 1906.

Pursh, F.: Flora Americae septentrionalis. Second ed. London, 1816.

Rechinger, K. H.: Vorarbeiten zu einer Monographie der Gattung Rumex:
I. In Beihefte z. Botanischen Centralblatt, Bd. 49, Abt. II. Dresden, 1932.
II. In Fedde, Repertorium specierum novarum, Bd. 31. Berlin, 1933.
III. In Arkiv för Botanik, Bd. 26A, No. 3. Stockholm, 1933.
IV. In Oesterr. Botan. Zeitschr., Bd. 84. Wien, 1935.

Rydberg, P. A.: Flora of the Rocky Mountains and adjacent plains. Second ed. New York, 1922.

——— Flora of the prairies and plains of central North America. New York, 1932.

Small, J. K.: Flora of the southeastern United States. New York, 1903.

Tidestrom, I.: Flora of Utah and Nevada. Contrib. U. S. Nat. Herb., 25. Washington, 1925.

Trelease, W.: Revision of the American species of *Rumex* occurring north of Mexico. Missouri Botanical Garden, Third Ann. Rept. St. Louis, 1893.

Watson, S.: Geological Survey of California. Botany, 2. Cambridge, Mass., 1880.

Wooton, E. O., and Standley, P. C.: Flora of New Mexico. Contrib. U. S. Nat. Herb., 19. Washington, 1915.

BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

VOLUME XVII NUMBER 2

STUDIES OF AMERICAN PLANTS—VII

BY

PAUL C. STANDLEY
CURATOR OF THE HERBARIUM, DEPARTMENT OF BOTANY

B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF B
EDITOR

PUBLICATION 390

CHICAGO, U.S.A.
SEPTEMBER 28, 1937

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

STUDIES OF AMERICAN PLANTS—VII

PAUL C. STANDLEY

Since publication of the sixth number of this series (in 1936) there have reached Field Museum, from diverse sources, extensive series of plants for determination, chiefly from Mexico, Central America, and various parts of South America. Coming from regions little known botanically, some of these collections quite naturally have yielded many plants that are very clearly or presumably new. Upon the following pages a few of these new species are described.

The largest number of the species described belong to the economically important Moraceae, and are the result of study of the complete series of this family obtained by Mr. B. A. Krukoff during his several extended expeditions to the Amazon Valley. Except for studies of the group by Dr. Adolpho Ducke, based upon his own intensive exploration of Amazonia, the Moraceae have received scant attention in recent years, therefore it is not surprising that the Krukoff collections contained a large number of new trees, especially in such groups as *Ficus*, *Pourouma*, and *Coussapoa*, that have received less attention than genera like *Brosimum* and its relatives.

Several other large sendings are represented here by new species. Especially rich in this respect is the well prepared and annotated series of specimens obtained in the State of Boyacá, Colombia, by Mr. Alexander E. Lawrance. It would seem, upon reference to recent monographs, that the vast majority of the Lawrance plants are proving new, and those described here by the writer are only a few of the total number he has indicated as new.

Likewise important is another handsome collection obtained during several seasons by Mr. Howard Scott Gentry in the Río Mayo district of the states of Sonora and Chihuahua, Mexico. Although so much of Mexico has been fairly well explored by botanists, this area seems to have been virgin territory, and Mr. Gentry's material has been found significant, not only for the rather numerous new species it contains, but also because of the dozens of notable extensions of range that it illustrates.

Field Museum has been particularly fortunate in receiving from the University of Texas, through Professor B. C. Tharp, several thousands of specimens from northeastern Mexico. These, too, have come mostly from new regions, and have added a great deal to our knowledge of distribution of Mexican plants.

There must be mentioned also the extraordinary collection made in the State of Nuevo León, Mexico, in 1935, by Mr. C. H. Mueller, and forwarded for determination to the writer from the Arnold Arboretum, through the courtesy of Dr. Alfred Rehder. A collection so rich as this in novelties proves that much still can be learned about the Mexican flora. In the case of this sending, as with most of the others mentioned, there are published here only a few of the most conspicuous of the many new plants obtained.

MORACEAE

Brosimum caniceps Standl., sp. nov.—Arbor 24-metralis, ramulis teretibus subferrugineis glabratis, novellis subdense minute griseo-sericeis, internodiis brevibus; stipulae caducae triangulari-ovatae usque 5 mm. longae acuminatae extus dense albido-sericeae; folia mediocria breviter petiolata subcoriacea, petiolo 10–13 mm. longo crassiusculo primo minute griseo-sericeo cito glabrato; lamina oblanceolato-oblonga vel obovato-oblonga 8–13 cm. longa 3–4.5 cm. lata abrupte breviter acuminata vel apice rotundata vel truncato-rotundata et in acumen breve acutum subito contracta, basin versus sensim angustata, basi ipsa oblique obtusa vel acuta, supra in sicco sublucida vel opaca scaberula vel fere laevis, nervis pallidis prominulis, subtus paullo pallidior, scaberula vel glabrata, costa gracili elevata, nervis lateralibus utroque latere circiter 9 angulo recto vel paullo latiore adscendentibus subarcuatis prope marginem irregulariter arcuato-conjunctis, venulis teneribus vix elevatis laxe reticulatis; capitula geminata axillaria globosa cana 5–7 mm. diam., pedunculo crassiusculo 6–15 mm. longo ut videtur interdum recurvo dense minute albido-puberulo, bracteis basalibus parvis ovatis acutis vel obtusissimis extus dense minute cano-sericeis, bracteolis peltatis densissime griseo-sericeis vel puberulis, floribus masculis numerosissimis, antheris semiexsertis, flore femineo 1; fructus globosus 1 cm. vel ultra diam. bracteolis persistentibus dense conspersus; semen 1.—Brazil: On terra firma, near mouth of Rio Macauhan, a tributary of Rio Yaco, Territory of Acre, August 9, 1933, *B. A. Krukoff 5378* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.); also *No. 5645*, collected in the same region August 25.

Rather similar to *B. acutifolium* Huber, which has been referred to the segregate genus *Brosimopsis*, but I see no reason for separating the present plant from *Brosimum. B. caniceps* is distinguished

principally by having the leaves evidently broadest above the middle, and by its conspicuously whitish flower heads.

Brosimum Krukovii Standl., sp. nov.—Arbor 54-metralis omnino glabra, ramulis teretibus, novellis ferrugineis, cortice cito exfoliante, internodiis brevibus; stipulae ferrugineae angustae fere 2 cm. longae attenuato-acuminatae diutius persistentes; folia inter minora subcoriacea breviter petiolata, petiolo ferrugineo crassiusculo circiter 6 mm. longo; lamina late ovalis vel ovato-ovalis 5–7.5 cm. longa 3–5 cm. lata, apice rotundata vel late rotundata et abrupte in acumen breve obtusum vix ultra 4 mm. longum contracta, basi late rotundata vel truncata, supra plus minusve lucida, costa elevata, nervis vix elevatis, subtus concolor, in sicco interdum brunnescens, costa gracili valde elevata, nervis lateralibus utroque latere circiter 15 pallidis teneris vix elevatis angulo lato divergentibus leviter arcuatis juxta marginem obscure arcuato-junctis, venulis obscuris sed arcte reticulatis; pedunculus fructifer crassus 1 cm. longus et ultra ferrugineus, cortice exfoliante; fructus juvenilis irregulariter subglobosus aliquanto depressus bracteolis peltatis brunnescentibus dense conspersus fere 1.5 cm. latus; semina ut videtur plus quam 1.—Brazil: State of Amazonas, Humayta, near Livramento, Rio Livramento, on terra firma, October–November, 1934, *B. A. Krukoff 6656* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Vernacular name Muiratinga. The relationship is with *B. paraense* Huber, an apparently common tree of the Amazon Valley, which has relatively narrower leaves, obtuse to acutish at the base and with a longer apical acumination, also narrower stipules.

Brosimum myristicoides Standl., sp. nov.—Arbor 21-metralis, ramulis teretibus crassiusculis, novellis ferrugineis minutissime brunneo-puberulo-tomentellis, internodiis breviusculis; stipulae caducae angustae circiter 2 cm. longae longiattenuatae dense brunneo-sericeae; folia breviter petiolata subcoriacea majuscula, petiolo 10–14 mm. longo minutissime puberulo-tomentello; lamina anguste oblonga vel lanceolato-oblonga 9.5–18 cm. longa 3.5–5 cm. lata sensim vel subabrupte acuminata, basi anguste rotundata vel obtusissima, supra lucida glabra laevis, nervis venisque non elevatis, subtus fere concolor, in sicco brunnescens, minutissime inter venulas puberula, costa gracili elevata, nervis lateralibus utroque latere circiter 23 tenerrimis angulo lato abeuntibus fere rectis vel leviter arcuatis juxta marginem irregulariter junctis, venulis subprominulis arctissime reticulatis; pedunculi geminati 6–8 mm. longi crassiusculi minute puberuli, capitulis globosis, in statu florifero vix ultra 3 mm. diam., floribus masculis sat numerosis, bracteolis peltatis brunnescentibus sparse minutissime puberulis, flore femineo ut videtur 1; fructus immaturus globosus 12 mm. diam. minute scaberulus et bracteolis conspersus.—Brazil: State of Amazonas, Humayta, near Livramento, on Rio Livramento, on terra firma, October–November, 1934, *B. A. Krukoff 6685* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Vernacular name Murure. The long, narrow leaves, conspicuously brownish beneath, are suggestive of those of some species of *Virola* (Myristicaceae).

Brosimum palmarum Standl., sp. nov.—Arbor 27-metralis, ramulis teretibus, novellis fusco-ferrugineis gracilibus minute sparse brunneo-sericeis vel glabratis, internodiis brevibus; stipulae parvae late triangulari-ovatae deciduae vix ultra 4 mm. longae acutae minute sericeae; folia inter minora breviter petiolata firme membranacea, petiolo gracili 8–10 mm. longo sparse sericeo vel fere glabro; lamina oblongo-ovalis 5.5–8.5 cm. longa 3–4 cm. lata apice obtusa vel rotundata et abrupte in acumen obtusiusculum ad 6 mm. longum contracta, basi valde oblique obtusa vel subrotundata, supra lucida glabra, nervis non elevatis, in sicco fusca, subtus multo pallidior, minutissime sparse scaberula, costa gracili prominente, nervis lateralibus utroque latere circiter 10 angulo fere recto abeuntibus teneris fere rectis, remote a margine in nervum irregularem collectivum conjunctis, venulis non elevatis arcte reticulatis; pedunculi geminati 1–2.5 cm. longi graciles sparse minute scaberuli vel fere glabri, capitulis irregularibus sublobatis circiter 1 cm. latis bracteolis paucis magnis brunnescentibus inaequalibus puberulis conspersis.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, on high land, September–October, 1936, *B. A. Krukoff 8546* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

This species has much similarity to *B. potabile* Ducke, found in the same region, but that seems to differ sufficiently in its thicker, relatively longer and narrower, long-acuminate leaves, and apparently also in its shorter peduncles.

Coussapoa araneosa Standl., sp. nov.—Frutex vel arbor epiphytica interdum ut dicitur subscandens, ramulis crassis brunneis subdense hirtellis; stipulae dense hirtellae; folia magna longipetiolata firme membranacea, petiolo 4–11 cm. longo et ultra striato brunneo hirtello; lamina late ovata vel cordato-ovata 20–45 cm.

longa 12–27 cm. lata, integra vel undulata, apicem obtusum versus angustata, basi breviter (ad 2 cm.) cordata, sinu fere clauso, vel interdum tantum late rotundata, supra viridis scaberula et asperrima, subtus grisea et ubique araneoso-tomentosa, costa gracili elevata, nervis lateralibus utroque latere circiter 16 angulo semirecto adscendentibus rectis marginem fere attingentibus, venulis transversis creberrimis arcte parallelis hirtellis prominentibus; pedunculi feminei axillares geminati monocephali valde elongati 6 12 cm. longi crassi dense minute hirtelli, capitulis fructiferis didymo-globosis 1.5–2 cm. latis densissime multifloris; fructus dense minutissime tomentellus.—Brazil: State of Amazonas, Humayta, near Tres Casas, on varzea land, September–October, 1934, *B. A. Krukoff 6524* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.); also *No. 6165* from the same region.

Vernacular name Apui. In the type collection the leaves are merely broadly rounded at the base, while in No. 6185 they are deeply and narrowly cordate. It is probable, nevertheless, that the two collections are conspecific, since they seem to differ in no other respect, and agree in the distinctive, cobwebby pubescence of the lower leaf surface.

Coussapoa boliviana Standl., sp. nov.—Ramuli crassi dense sericeo-tomentelli, internodiis brevibus; stipulae 4 cm. longae angustae deciduae dense minute sericeae acutae; folia mediocria longiuscule petiolata subrigide coriacea, petiolo circiter 5 cm. longo striato dense tomentello; lamina subrotunda, elliptico-rotunda vel ovato-rotunda 10–14 cm. longa 8.5–11.5 cm. lata, apice rotundata vel rotundato-obtusa, basi rotundata et subemarginata, supra viridis sparse scaberula asperula, nervis non elevatis, subtus paullo pallidior ubique dense minute hirtella, ad nervos araneoso-tomentosa, costa crassiuscula elevata, nervis lateralibus utroque latere circiter 14 angulo semirecto vel paullo latiore adscendentibus rectis marginem attingentibus, venulis transversis parallelis creberrimis prominulis; pedunculus (unus sejunctus tantum visus) crassus 2 cm. longus dense minute hirtellus, capitulo femineo subgloboso 8 mm. lato densissime multifloro, perianthio dense brunneo-puberulo.—Bolivia: Bosque virgen, Río Víbora, Prov. Ichilo, Depart. Santa Cruz, 350 meters, October, 1926, *José Steinbach 7567* (type in Herb. Field Mus.).

Vernacular name Higo del monte. The type material is rather unsatisfactory, but the form of the leaves is alone sufficient to show that it represents a distinct and apparently unnamed species.

Coussapoa cornifolia Standl., sp. nov.—Arbor 18-metralis, trunco 18 cm. diam., interdum epiphytica, ramulis crassiusculis ferrugineis striatis, novellis sparse strigillosis, internodiis brevibus; stipulae 7–9 mm. longae late ovatae acutae densissime ochraceo-sericeae deciduae; folia inter minora breviter petiolata coriacea, petiolo crassiusculo 5–15 mm. longo fere glabro; lamina oblongo-ovata vel elliptico-ovata 7–14 cm. longa 4.5–6 cm. lata subabrupte longiacuminata vel obtusa et abrupte in acumen breve latum obtusum contracta, basi obtusa vel rotundata, supra sublucida, glabra, costa subimpressa, venulis prominulis, subtus pallidior, ubique minutissime et densissime sub lente puberula atque ut videtur interdum aliquanto glandulosa, costa crassiuscula elevata, nervis lateralibus utroque latere 6–8 angulo semirecto adscendentibus elevatis leviter arcuatis vel fere rectis juxta marginem arcuato-conjunctis, venulis transversis plus minusve arcuatis crebris elevatis; pedunculi axillares geminati 1.5–2 cm. longi, inflorescentiis utriusque sexus laxe paniculatis 2–3 cm. longis et ultra, aequilatis, ramis divaricatis gracilibus sparse vel dense hirtellis, capitulis numerosis longiuscule pedunculatis globosis dense multifloris fere minutis 2–3 mm. tantum diam., perianthio floris feminei glabro; stamina bene exserta, filamento anthera multo longiore; fructus maturus non visus.—Brazil: State of Amazonas, São Paulo de Olivença, basin of Belem Creek, in high forest, October–December, 1936, *B. A. Krukoff 8897* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.); also *Nos. 8658* and *8755* from the same region. Near Palmares in the same region, *Krukoff 8539.*

The four collections cited exhibit some variation but not more, probably, than is to be expected within a species. The plant is noteworthy for the relatively small, mostly acuminate leaves, and the extremely small flower heads.

Coussapoa Eggersii Standl., sp. nov.—Ramuli crassi sparse hispidi; stipulae angustae circiter 4 cm. longae acutae brunnescentes dense tomentellae et sparse pilis albis adpresso-hispidae; folia inter majora petiolata coriacea, petiolo crassiusculo 4.5 cm. longo dense adpresse tomentuloso; lamina late deltoideo-ovata 21 cm. longa 16 cm. lata apice rotundata et brevissime apiculata, basi breviter (vix 1 cm.) cordata, supra glabra vel glabrata opaca laevis puncticulata, subtus in sicco pallide brunnescens ubique dense minute hirtella, ad nervos sparse in statu adulto araneoso-tomentosa, costa gracili elevata, nervis lateralibus utroque latere circiter 13 angulo semirecto vel paullo latiore adscendentibus rectis marginem attingentibus, venulis transversis creberrimis elevatis leviter arcuatis vel fere rectis; inflorescentiae femineae axillares geminatae breviter pedunculatae petiolum subaequantes, capitulis paucis racemosis breviter crasse pedunculatis densissime multifloris dense minute hirtellis globosis 5–8 mm. latis, pedunculis densissime tomentellis.—Ecuador: El Recreo, *H. F. A. Eggers 14165* (type in Herb. Field Mus.).

Local name Matapalo. Related to the Peruvian *C. hirsuta* Trécul and *C. villosa* Poepp. & Endl.

Coussapoa embirana Standl., sp. nov.—Arbor ut dicitur scandens, ramulis crassis ferrugineis striatis subdense hispido-hirsutis, cicatricibus stipularum valde obliquis et dimidium internodii aequantibus; stipulae latiusculae caducae 6.5 cm. longae dense piloso-sericeae acutae; folia magna longipetiolata firme coriacea, petiolo crasso circiter 8 cm. longo breviter hispido; lamina rotundato-ovata circiter 23 cm. longa atque 18 cm. lata obtusissima, basi subcordata vel subtruncata, undulato-subcrenata, supra in sicco pallida opaca scaberula tactu asperula, nervis non elevatis, subtus concolor, brunnescens, tactu aspera, ubique scaberula, praesertim in statu juvenili ad nervos araneoso-tomentosa, costa crassa elevata, nervis lateralibus utroque latere circiter 16 angulo paullo latiore quam recto adscendentibus rectis marginem attingentibus, venulis transversis creberrimis subarcuatis prominulis; inflorescentiae masculae axillares geminatae 3 cm. longe pedunculatae petiolo breviores paniculatae 3 cm. longae, pedunculo tomentello et hispido, capitulis paucis longiuscule pedunculatis subglobosis circiter 6 mm. latis densissime pilosulis, antheris breviter exsertis.—Brazil: State of Amazonas, near mouth of Rio Embira, a tributary of Rio Tarauaca, Basin of Rio Juruá, on varzea land, June 26, 1933, *B. A. Krukoff 4994* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Vernacular name Apiu. Although having no particularly outstanding characters, except perhaps the hirsute pubescence of the branches, this *Coussapoa* does not agree with any of the known species of the Amazonian Basin.

Coussapoa ficina Standl., sp. nov.—Arbor 11-metralis, trunco 12 cm. diam.; stipulae triangulares caducae 12 mm. longae acutae densissime hispidulo-pubescentes ferrugineae; folia inter majora petiolata coriacea, petiolo crassiusculo 5–6 cm. longo ferrugineo striato minutissime sparse tomentello; lamina late rotundo-ovata vel late ovali-ovata circiter 20 cm. longa atque 16 cm. lata, apice anguste rotundata, basi rotundata et breviter (vix ad 1 cm.) cordata, supra in sicco fusco-brunnescens aspera minute scaberula, nervis non elevatis, opaca, subtus multo pallidior, tactu mollis, ubique minute puberula, costa crassiuscula elevata, basi 7-nervia, nervis lateralibus utroque latere circiter 6 angulo semirecto adscendentibus fere rectis marginem fere attingentibus, venulis transversis remotis valde irregularibus arcuatis venulis prominulis arcte reticulatis connexis; inflorescentiae femineae axillares geminatae petiolo duplo breviores breviter pedunculatae, capitulis vulgo 3 subglobosis 1 cm. et ultra diam., densissime multifloris, breviter pedunculatis, perianthio glabro, pedunculis crassis dense brunneo-tomentellis.—Brazil: State of Amazonas, Manaos, along the road to Aleixo, August–September, 1936, *B. A. Krukoff 7966* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

The large leaves are rather suggestive of those of certain species of *Ficus*. They are distinctive in outline and pubescence.

Coussapoa Froesii Standl., sp. nov.—Frutex epiphyticus scandens vel subscandens, ramulis crassiusculis teretibus ferrugineis glabris, internodiis brevibus; stipulae non visae; folia majuscula petiolata firme coriacea, petiolo crasso fusco 2.5–4.5 cm. longo striato glabro; lamina rotundato-elliptica vel rotundato-ovata 13.5–16 cm. longa 10.5–14.5 cm. lata, apice rotundata vel obtusissima, basi rotundata vel emarginata, utrinque glabra laevis, supra opaca, nervis venisque prominulis, subtus fere concolor, in sicco aliquanto brunnescens, basi 7-nervia, costa crassa elevata, nervis lateralibus utroque latere circiter 5 angulo semirecto vel paullo angustiore adscendentibus leviter arcuatis vel fere rectis marginem fere attingentibus, venulis transversis subremotis arcuatis vix prominulis; inflorescentia feminea parva petiolo triplo brevior breviter pedunculata paniculata, capitulis paucis vix 2 mm. crassis globosis paucifloris densis, perianthio glabro, ramis gracillimis hirtellis, capitulis graciliter longiuscule pedunculatis.—Brazil: State of Maranhão, on terra firma, Mata da Cachoeira, Maracassumé River region, September 14, 1932, *R. Froes 1907* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Noteworthy for the absence of pubescence on the branches and leaves.

Coussapoa hypochlora Standl., sp. nov.—Arbor 15–21-metralis, ramulis crassissimis teretibus pallidis in statu juvenili minute adpresse pallido-tomentellis, internodiis brevibus; stipulae latae 3.5 cm. longae ferrugineae acutae minute tomentellae vel glabratae caducae; folia magna longipetiolata crasse membranacea, petiolo gracili 4–11 cm. longo canaliculato fere glabro sed versus apicem sparse hirsuto; lamina rotundo-elliptica circiter 25 cm. longa atque 18 cm. lata, apice rotundata et brevissime emarginata, basi anguste rotundata, supra in sicco fusco-viridis laevis, tantum ad nervos sparse breviter hirsuta, aliter glabra, sublucida, venulis prominulis, subtus fere concolor, viridis, in statu juvenili ad nervos sparse breviter hirsuta aliter sparse hirtella, cito glabrata laevis, basi 5-nervia, costa gracili elevata, nervis lateralibus utroque latere circiter 6 angulo paullo angustiore quam recto adscendentibus rectis, venulis transversis subremotis irregularibus paullo arcuatis venulis ultimis arcte reticulatis connexis; inflorescentiae masculae laxe paniculatae axillares geminatae petiolum fere aequantes, pedunculo usque 5 cm. longo minute puberulo, paniculis ad 5 cm. longis et aequilatis, ramis dense puberulis, capitulis numerosissimis globosis vel didymo-globosis circiter 5 mm. latis, bracteolis peltatis brunneis fere glabris, pedunculis brevibus.—Colombia: Region of El Humbo, State of Boyacá, 1,140 meters, in high forest, May 19, 1933, *A. E. Lawrance 810* (type in Herb. Field Mus.).

Vernacular name Caraco. Flower heads cream-colored; a black sap flows freely from the limbs when cut. The species is well distinguished by the thin, long-petiolate leaves which are green on the lower surface.

Coussapoa Krukovii Standl., sp. nov.—Arbor 15-metralis, trunco 15 cm. diam., ramulis crassis, internodiis brevibus, cicatricibus stipularum vix obliquis, novellis minute sericeo-tomentellis et sparse hirsutulis; stipulae angustae 7 cm. longae caducae ferrugineae attenuatae extus dense strigosae et albido-tomentosae, intus adpresso-hispidulae; folia majuscula longipetiolata coriacea, petiolo fusco 6–7 cm. longo striato albo-tomentoso; lamina late deltoideo-ovata 14–19 cm. longa 10–13 cm. lata obtusa et breviter apiculata, basi late rotundata vel interdum tantum obtusa, supra in sicco opaca asperrima scabra in sicco brunnescens, nervis subimpressis, subtus albida, ubique dense adpresse albo-tomentosa, ad venulas hispidula, basi 5-nervia, costa gracili elevata, nervis lateralibus utroque latere circiter 15 angulo semirecto adscendentibus rectis marginem attingentibus, venulis transversis creberrimis fere rectis prominentibus, margine obscure undulato-crenato; inflorescentiae masculae petiolo aequilongae vel paullo longiores laxe paniculatae 3–4 cm. longe pedunculatae, ramis gracilibus dense minute velutino-pilosulis, pedunculis usque 8 mm. longis, capitulis numerosis globosis circiter 5 mm. latis dense ochraceo-hispidulis, antheris bene exsertis.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, on high land, September–October, 1936, *B. A. Krukoff 8223* (type in herb. N.Y. Bot. Gard.; photo. and fragment in Herb. Field Mus.).

Coussapoa Lawrancei Standl., sp. nov.—Arbor 30-metralis, ramulis crassis teretibus ferrugineis pilis longis patentibus hirsutis, internodiis brevibus; stipulae angustae caducae 5 cm. longae dense pilis longis albidis et nigrescentibus intermixtis hirsutae acuminatae; folia magna longipetiolata crasse coriacea, petiolo gracili ferrugineo striato 6–8.5 cm. longo sparse hirsuto; lamina elliptico-ovata vel oblongo-elliptica 17–21 cm. longa 9.5–12.5 cm. lata obtusa vel apice anguste rotundata, basi rotundata et interdum leviter emarginata, supra in sicco griseo-viridis laevis opaca glabra, nervis venisque non elevatis, subtus fere concolor, sparse laxe arachnoideo-tomentosa vel glabrata, basi 5–7-nervia, nervis lateralibus utroque latere circiter 16 angulo semirecto adscendentibus rectis marginem attingentibus, venulis transversis remotiusculis undulatis venulis ultimis prominentibus arctissime reticulatis connexis, margine integro vel subundulato; inflorescentia mascula laxe paniculata petiolo duplo brevior pedunculata, ramis ferrugineis gracilibus dense hirtellis et sparsius hirsutis, pedunculis gracilibus usque 13 mm. longis, capitulis paucis subglobosis ad 8 mm. latis brunneis hirtellis, antheris bene exsertis.—Colombia: In high forest, El Humbo, State of Boyacá, 900 meters, April 26, 1933. *A. E. Lawrance 769* (type in Herb. Field Mus.).

Local name Caraco. "Freshly cut stems are hollow and contain a white, gummy substance. The outer ring of bark turns black after being cut." The species is noteworthy for the abundant, hirsute pubescence.

Coussapoa Lehmannii Standl., sp. nov.—Folia inter maxima; petioli crassi ferruginei striati sparse puberuli vel glabrati; lamina late ovata 28–35 cm. longa 19–26 cm. lata apice obtusa vel anguste rotundata et brevissime apiculata, basi late rotundata, subcoriacea, supra in sicco fusca opaca laevis glabra, nervis non elevatis, subtus brunnescens, ubique dense patenti-pilosa, sparse brunneo-arachnoideo-tomentosa, basi 7-nervia, nervis lateralibus utroque latere circiter 14 angulo semirecto adscendentibus rectis marginem attingentibus, venis transversis crebris undulatis prominentibus venulis ultimis arcte reticulatis prominulis connexis; capitula feminea axillaria geminata crasse 3 cm. longe pedunculata didymo-globosa 1.5

cm. lata densissime multiflora, perianthio dense minute hirtello, pedunculo dense puberulo.—Ecuador: Chacayacu, western Andes of Cuenca, 200–800 meters, *F. C. Lehmann 5606* (type in Herb. Field Mus.).

Coussapoa orthoneura Standl., sp. nov.—Arbor 11–33-metralis, trunco 10–22 cm. diam., ramulis crassis ferrugineis subangulatis sparse minute strigillosis vel fere glabris, internodiis brevibus, cicatricibus stipularum paullo obliquis; stipulae latiusculae fere 2 cm. longae ferrugineae acuminatae caducae dense sericeae; folia inter minora petiolata firme coriacea, petiolo 1.5–4 cm. longo sparse sericeo vel glabrato; lamina oblongo-obovata 7–13.5 cm. longa 3.5–6.5 cm. lata acuta vel subacuta, rarius obtusa, basin versus paullo angustata, basi ipsa obtusa vel anguste rotundata, supra in sicco brunnescens opaca laevis glabra, nervis vix elevatis, subtus fere concolor, in statu juvenili ut videtur laxe arachnoideo-tomentosa sed cito glabrata, ad nervos sparse sericea sed in statu adulto fere omnino glabra, basi 3-nervia vel obscure 5-nervia, costa gracili elevata, nervis lateralibus utroque latere 5 angulo angustiore quam recto adscendentibus prominentibus rectis marginem attingentibus, venulis transversis obscuris vix elevatis, margine integro vel apicem versus paullo undulato-crenato; inflorescentiae laxe paniculatae axillares geminatae petiolum aequantes vel longiores, ramis puberulis vel breviter pilosis; capitula mascula numerosissima graciliter pedunculata vix ultra 2 mm. diam., perianthio glabro, antheris subexsertis; capitula feminea pauca, vulgo 3, interdum 1 tantum, globosa glabra usque 8 mm. lata, breviter crasse pedunculata.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, on high land, September–October, 1936, *B. A. Krukoff 8518* (pistillate; type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.). Also *No. 8967* (staminate) from the same general region, basin of Belem Creek.

Remarkable for the small, narrow leaves with few, strongly ascending nerves.

Coussapoa parvifolia Standl., sp. nov.—Arbor epiphytica, ramulis subgracilibus, novellis dense foliatis ferrugineis sparse minute strigillosis vel glabratis, cicatricibus stipularum paullo obliquis; stipulae (bene evolutae non visae) angustae breves acutae dense fulvo-sericeae caducae; folia parva breviter petiolata coriacea, petiolo 7–15 mm. longo crassiusculo fere glabro; lamina lanceolato-oblongo 5–8 cm. longa 1.7–3 cm. lata subabrupte acuta vel acuminata, acumine ipso obtuso, basin versus paullo angustata, basi ipsa anguste rotundata, supra in sicco subgrisea glabra laevis, nervis non elevatis, subtus pallidior, tactu mollis, ubique minutissime puberula, basi trinervia, nervis lateralibus utroque latere circiter 7 angulo angustiore quam recto adscendentibus fere rectis marginem attingentibus, venulis transversis crebris irregularibus venulis ultimis prominulis arcte reticulatis connexis, margine integro; capitula feminea axillaria geminata 1–1.5 cm. longe pedunculata subglobosa 7 mm. lata dense multiflora, perianthio glabro, pedunculo crassiusculo scaberulo vel fere glabro.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, in high forest, September–October, 1936, *B. A. Krukoff 8273* (type in herb. N. Y. Bot. Gard.).

This has perhaps the smallest leaves of any species of the genus.

Coussapoa rhamnoides Standl., sp. nov.—Arbor epiphytica, ramulis crassis teretibus transverse annulatis fusco-ochraceis, cicatricibus stipularum paullo obliquis, novellis ut videtur glabris vel fere glabris apice dense foliatis; stipulae caducae triangulares ferrugineae 13 mm. longae acuminatae extus dense puberulo-tomentellae; folia mediocria petiolata coriacea, petiolo gracili 1.5–3.5 cm. longo fere omnino glabro; lamina elliptico-obovata vel ovali-obovata 8–13 cm. longa 5–8.5 cm. lata, apice rotundata atque brevissime late emarginata, basin versus paullo angustata, basi ipsa anguste rotundata et interdum obscure emarginata, supra in sicco fusco-brunnescens sublucida glabra laevis, venulis prominulis et arctissime reticulatis, subtus fere concolor saltem in statu adulto omnino glabra, basi 3-nervia, nervis lateralibus utroque latere 4–5 angulo semirecto adscendentibus leviter arcuatis in marginem desinentibus, venulis transversis crebris undulatis prominentibus venulis ultimis prominulis laxe reticulatis connexis, margine versus apicem paullo undulato; inflorescentiae femineae laxe paniculatae petiolum fere aequantes 1.5 cm. longe pedunculatae, ramis minutissime puberulis, capitulis paucis globosis 5–6 mm. diam. crasse pedunculatis, perianthio fere glabro.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, varzea land, September–October, 1936, *B. A. Krukoff 8406* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

Well marked by the glabrous, somewhat obovate, few-nerved leaves which are rounded and very shallowly emarginate at the apex.

Coussapoa subcrenata Standl., sp. nov.—Arbor vel arbuscula subscandens epiphytica, ramulis crassis subteretibus ferrugineis striatis, cicatricibus stipularum valde obliquis, internodiis brevibus, novellis sparse hirtellis vel fere glabris; stipulae angustae caducae 2.3 cm. longae acutae dense hispidulae; folia mediocria petiolata coriacea, petiolo gracili ferrugineo striato 2.5–5.5 cm. longo dense breviter hirtello; lamina late elliptico-ovata vel rotundato-ovata 9–17 cm. longa 6.5–13 cm. lata obtusa, basi late rotundata vel interdum anguste rotundata et leviter emarginata, supra in sicco subgrisea tactu asperula opaca sparse scaberula, venulis non elevatis sed interdum subimpressis, subtus pallidior, primo dense arachnoideo-tomentosa et albescens, serius plus minusve glabrata, basi 5–7-nervia, nervis lateralibus utroque latere circiter 10 rectis angulo semirecto adscendentibus marginem attingentibus, venulis transversis creberrimis fere rectis prominentibus, margine leviter undulato-crenato; inflorescentiae masculae laxe paniculatae petiolum fere aequantes, 1.5–2 cm. longe pedunculatae, ramis minute hirtellis, capitulis paucis globosis 4–5 mm. diam. graciliter pedunculatis, bracteolis dense puberulis brunneis, antheris longe exsertis.—Brazil: State of Amazonas, Paleta, Municipality of Teffe, valley of Rio Solimoes, on varzea land, May 21, 1933, *B. A. Krukoff 4518* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Ficus andicola Standl., sp. nov.—Ramuli crassi ferruginei striati, novellis sparse hirtellis vel glabratis, internodiis brevibus vel elongatis; stipulae caducae ferrugineae triangulares acuminatae 1.5 cm. longae; folia mediocria petiolata crasse coriacea, petiolo crasso 1–2.5 cm. longo glabro; lamina oblonga vel obovato-oblonga 7–12.5 cm. longa 3–6.5 cm. lata, apice obtusa vel rotundata, basi obtusa, truncata vel saepius emarginata vel leviter cordata, glabra, supra sublucida in sicco fusco-brunnescens, venulis prominulis reticulatis, subtus fere concolor, costa crassa prominente, nervis lateralibus utroque latere circiter 13 angulo lato divergentibus fere rectis remote a margine arcuato-conjunctis; receptacula axillaria sessilia geminata globosa 7–8 mm. diam. glabra ut videtur maculata, ostiolo fere plano, involucro bilobato, lobis glabris apice rotundatis circiter 4 mm. longis.—Colombia: Highlands of Popayán, 1,500–2,000 meters, *F. C. Lehmann 5807* (type in Herb. Field Mus.).

This is closely related to *F. Archeri*, and perhaps not really distinct, especially since both come from the same general region. However, *F. andicola* seems to differ sufficiently in its larger leaves with clearly more numerous lateral nerves.

Ficus Archeri Standl., sp. nov.—Ramuli crassi fusco-brunnei glabri, internodiis brevibus; stipulae late triangulares 1.5 cm. longae acuminatae caducae glabrae; folia inter minora breviter petiolata crasse coriacea, petiolo crasso circiter 1 cm. longo; lamina oblongo-obovata vel elliptico-oblonga 6–9 cm. longa 3–4.5 cm. lata, apice rotundata vel obtusissima, basin versus paullo angustata, basi ipsa late vel anguste rotundata, glabra, supra lucida, nervis venisque prominulis, in sicco griseo-viridis, subtus paullo pallidior, costa crassa elevata, nervis lateralibus utroque latere circiter 7 angulo latiusculo adscendentibus fere rectis remote a margine irregulariter arcuato-junctis, venulis prominulis laxe reticulatis; receptacula axillaria geminata sessilia globosa 1 cm. diam. glabra, ut videtur rubro tincta, ostiolo paullo elevato, involucro bilobato glabro, lobis circiter 5 mm. longis apice rotundatis.—Colombia: Popayán, Dept. El Cauca, May 7, 1935, *W. A. Archer 3369* (type in Herb. Field Mus.; duplicate in U. S. Nat. Herb.).

The leaves are distinctive in shape and venation, and remarkable for their thick texture and lustrous surface.

Ficus Eliadis Standl., sp. nov.—Arbor 5–8-metralis interdum epiphytica, ramulis crassis teretibus ochraceis vel brunneis, internodiis brevibus, novellis glabris vel glabratis; stipulae (perfecte evolutae non visae) caducae triangulares 7 mm. longae vel ultra densissime pilis longis fulvis subadpressis indutae; folia mediocria longipetiolata subcoriacea, petiolo gracili glabro 2–6 cm. longo; lamina late elliptica vel late ovalis 7–11 cm. longa 4.5–8.5 cm. lata, apice obtusa vel interdum rotundata, basi truncata vel rotundata, interdum late obtusa, glabra, supra griseo-viridis, opaca, subtus fere concolor, costa crassa pallida prominente, nervis lateralibus utroque latere 7–8 angulo lato abeuntibus teneris fere rectis prope marginem irregulariter arcuato-conjunctis, venulis obscuris vix elevatis laxe reticulatis; receptacula axillaria geminata circiter 3 mm. longe pedunculata globosa 8–13 mm. diam. glabra ut videtur viridia, ostiolo paullo depresso, involucro parvo extus sparse breviter piloso bilobato, lobis apice rotundatis vix ultra 3 mm. longis.—Colombia: Guájaro, region of Barranquilla, March, 1935, *Brother Elias 1290* (type in Herb. Field Mus.). Puerto Colombia, January, 1935, *Elias 1421*. Salgar, Puerto Colombia, January, 1935, *Elias 1377*.

Local name Matapalo. A species of no outstanding characters, but I have been unable to associate it with any reported from the northern coast of South America. It is dedicated to the collector, who has forwarded to Field Museum an invaluable series of material illustrating the flora of the Barranquilla region.

Ficus frondosa Standl., sp. nov.—Arbor epiphytica omnino glabra, ramulis crassis in sicco obtuse angulatis pallide brunneis, novellis lineolatis; stipulae perfectae non visae, 1 cm. longae et ultra, acuminatae, caducae; folia magna petiolata coriacea, petiolo crassiusculo 2.5–5 cm. longo; lamina oblonga vel anguste oblonga 25–28 cm. longa 9–11 cm. lata, apice rotundata vel obtusa et in acumen angustum acutiusculum 1–1.5 cm. longum contracta, basi rotundata vel obtusa, supra in sicco lucida viridis, nervis venisque prominulis, subtus brunnescens opaca, costa gracili valde elevata, nervis lateralibus utroque latere circiter 14 angulo latiusculo abeuntibus rectis remote a margine in nervum collectivum irregularem conjunctis, nervo secundario inter paria nervorum primariorum inserto et eis parallelo sed paullo teneriore, venulis prominulis arcte reticulatis; receptacula axillaria geminata crasse 4 mm. longe pedunculata globosa vel obovoideo-globosa fere 1 cm. lata glabra lineolis parvis atrorubris notata, ostiolo depresso magno phyllis 2 clauso, involucro fere 5 mm. lato non obvie bilobato ambitu irregulari.—Brazil: State of Amazonas, São Paulo de Olivença, basin of Belem Creek, in high forest, October–December, 1936, *B. A. Krukoff 8677* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

The very large, almost perfectly oblong leaves are distinctive. The receptacles as well as the involucre are covered with what appear to be irregular, dark reddish lines, which may, however, be the remains of weak trichomes.

Ficus Gameleira Standl., sp. nov.—Arbor 15-metralis, trunco 12 cm. diam., ramulis crassis fuscis teretibus dense annulatis apice dense foliatis, novellis dense hirsutis; stipulae non visae; folia majuscula petiolata crasse coriacea, petiolo crassiusculo 2–2.5 cm. longo hirsuto fusco-ferrugineo; lamina late cuneato-obovata vel ovali-obovata 10–15 cm. longa 7–9.5 cm. lata apice late rotundata, basin versus paullo angustata, basi ipsa obtusa vel anguste rotundata, supra in sicco griseo-viridis glabra, nervis venisque non elevatis, opaca, subtus fere concolor ochraceo-brunnescens, glabra vel tantum prope basin costae sparse hirsuta, costa crassa elevata, nervis lateralibus utroque latere circiter 10 angulo lato divergentibus elevatis fere rectis prope marginem irregulariter junctis, venulis obscuris vix prominulis laxe reticulatis; receptacula axillaria geminata magna crasse 4–5 mm. longe pedunculata globosa 2 cm. et ultra diam. dense minute tomentella, ostiolo magno paullo elevato, involucro bilobato 2 cm. longo, lobis apice rotundatis utrinque dense sericeis.—Brazil:

State of Maranhão, Maracassumé River region, Mata da Cachoeira, on sandy soil, terra firma, October 14, 1932, *R. Froes 1938* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

Local name Gameleira. The relationship is evidently with *F. Urbaniana* Warb., which ranges from the West Indies to Peru. It, however, lacks the hirsute pubescence so characteristic of the Brazilian tree.

Ficus Gleasonii Standl., sp. nov.—Arbor ut dicitur parva omnino glabra, ramulis crassiusculis fuscis vel ochraceis striatis, internodiis brevibus; stipulae anguste triangulares caducae acuminatae vix ultra 7 mm. longae ferrugineae; folia parva petiolata crasse coriacea, petiolo crasso 7–15 mm. longo; lamina anguste elliptico-oblonga, elliptico-oblonga, elliptico-oblanceolata, rare fere lineari-lanceolata, 5.5–12 cm. longa 2–4.5 cm. lata, rare 1 cm. tantum lata, acuta vel obtusa, rare abrupte breviter obtuso-acuminata, basi acuta vel obtusa, opaca, supra in sicco saepe griseo-viridis, nervis venisque non elevatis, subtus vulgo brunnescens, costa crassa elevata, nervis lateralibus utroque latere circiter 11, aliis intermediis parallelis paullo tenerioribus interpositis, angulo latiusculo abeuntibus fere rectis versus marginem arcuato-junctis, venulis vulgo prominulis et laxe reticulatis; receptacula axillaria geminata vel interdum fasciculata parva 2–4 mm. longe crassiuscule pedunculata, globosa glabra interdum maculata plerumque 5–6 mm. diam., ostiolo fere plano, involucro parvo bilobato vix ultra 3 mm. lato, lobis apice rotundatis glabris.—British Guiana: Upper Mazaruni River, September–October, 1922, *J. S. De La Cruz 2396* (type in Herb. Field Mus.), *2359*. Kamakusa, upper Mazaruni River, *De La Cruz 4137*, *2870*. Assakatta, Northwest District, *De La Cruz 4267*. Upper Rupununi River, near Dadanawa, *De La Cruz 1558*. Wismar, *Persaud 7*. Comaka, Demerara River, riverside and woods, *Persaud 228*.

Local names Bird fig and Kumaka-balli. The specimens show considerable variation, especially in leaf outline, but I am inclined to believe that all are conspecific, unless it may be *De La Cruz 4137*, which is distinguished by its extremely narrow leaves.

Ficus Haughtii Standl., sp. nov.—Frutex vel arbor epiphytica omnino glabra, ramulis crassiusculis, internodiis brevibus; stipulae angustae attenuatae caducae 1 cm. longae vel ultra; folia mediocria breviter petiolata papyracea, petiolo crassiusculo 1–2.5 cm. longo; lamina anguste oblanceolato-oblonga 11–16 cm. longa 3.5–5 cm. lata, apice obtusa et abrupte in acumen angustum attenuatum acutum fere 1 cm. longum contracta, basin versus longe sensim attenuata, basi ipsa cuneato-obtusa, supra in sicco viridis opaca densiuscule albido-puncticulata, nervis prominulis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere circiter 13, altero paullo teneriore parallelo inter paria interjecto, angulo latiusculo divergentibus fere rectis prope marginem irregulariter arcuato-conjunctis, venulis inconspicuis prominulis laxe reticulatis; receptacula axillaria geminata sessilia globosa sparse minute puberula vel fere glabra circiter 8 mm. diam., ostiolo paullo elevato majusculo, involucro fere 5 mm. lato bilobato, lobis apice rotundatis extus glabris.—Colombia: Department of Sur de Santander, Camp Zarzal, vicinity of Barranca Bermeja, Magdalena Valley, 100–500 meters, December 15, 1934, *Oscar Haught 1466* (type in Herb. Field Mus.; duplicate in U. S. Nat. Herb.).

Said to be known by the name Nisperillo, and to be tapped for rubber. The long, narrow leaves, gradually tapering toward the base, are characteristic for the species.

Ficus Krukovii Standl., sp. nov. Arbor 27-metralis glabra, trunco 20 cm. diam., ramulis brunneis crassiusculis in sicco subangulatis, internodiis brevibus vel subelongatis; stipulae (bene evolutae non visae) angustae attenuato-acuminatae caducae; folia magna petiolata subcoriacea lucida, petiolo gracili 1.5–2.8 cm. longo; lamina elliptico-oblonga 12–20 cm. longa 5.5–7.5 cm. lata abrupte breviter acuminata, acumine angusto 1.5–2 cm. longo, basi anguste rotundata, supra in sicco brunnescens, costa gracili elevata, nervis venisque quoque elevatis vel prominentibus, subtus fere concolor, costa valde elevata, nervis lateralibus utroque latere circiter 14 angulo lato divergentibus rectis prope marginem irregulariter arcuato-conjunctis, venulis prominulis laxe reticulatis; receptacula axillaria geminata crassissime vix ultra 2 mm. longe pedunculata vel fere sessilia subglobosa sparse minutissime tomentella vel fere omnino glabra circiter 6 mm. diam., ostiolo magno subdepresso, involucro glabro bilobato, lobis apice late rotundatis vix 3 mm. longis patentibus.—Brazil: State of Amazonas, São Paulo de Olivença, basin of Belem Creek, on high land, October–December, 1936, *B. A. Krukoff 9002* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.). State of Amazonas, near mouth of Rio Embira, June, 1933, *Krukoff 4902*.

All the receptacles seen are rather young, and it is probable that at maturity they are somewhat larger than the description indicates.

Ficus Lawrancei Standl., sp. nov.—Arbor 9–12-metralis fere omnino glabra, ramulis crassiusculis teretibus ochraceis, internodiis brevibus; stipulae deciduae ferrugineae lanceolato-triangulares filiformi-attenuatae vix 1 cm. longae extus sparse strigosae vel glabratae intus glabrae; folia mediocria petiolata coriaceo-chartacea, petiolo crassiusculo 1.5–2 cm. longo glabro; lamina elliptica 11–15 cm. longa 5–7.5 cm. lata subabrupte breviter acuminata, acumine angusto acutiusculo, basi obtusa et trinervia, glabra, supra in sicco fuscescens opaca, nervis venisque non elevatis, dense impresso-puncticulata, subtus fere concolor opaca, costa gracili elevata, nervis lateralibus utroque latere 8–9 angulo lato adscendentibus teneris arcuatis pallidis remote a margine irregulariter arcuato-conjunctis, venulis inconspicuis vix prominulis laxe reticulatis; receptacula axillaria geminata sessilia, interdum e nodis defoliatis nascentia, globosa, glabra, 6–8 mm. diam., ostiolo elevato, involucro bilobato 5–6 mm. lato adpresso vel patente, extus dense strigoso vel interdum fere glabro, intus glabro.—Colombia: Lower Chapón region, Department of Boyacá, thick forest fringes near stream side, 900 meters, *A. E. Lawrance 175* (type in Herb. Field Mus.).

Ficus malacocarpa Standl., sp. nov.—Arbor, ramulis crassis brunneis subteretibus dense fulvo-hirsutis, internodiis brevibus; stipulae deciduae ovatae acuminatae 1 cm. longae vel paullo ultra intus glabrae, extus dorso hirsutae, ad margines glabrae; folia inter minora breviter petiolata coriacea vel subcoriacea subfragilia, petiolo 5–12 mm. longo crasso dense hirsuto; lamina oblongo-obovata vel elliptico-oblonga 5.5–10 cm. longa 2.5–5 cm. lata, apice late rotundata vel interdum obtusa, basin versus paullo angustata, basi ipsa obtusa vel anguste rotundata, supra in sicco fuscescens tactu asperrima, praesertim ad nervos venasque hispidula, serius glabrata, nervis venisque prominentibus vel prominulis, subtus fere concolor, ad nervos venasque sat dense hispidula, basi trinervia, costa crassa elevata, nervis lateralibus utroque latere 4–5 angulo semirecto adscendentibus rectis vel subarcuatis versus marginem irregulariter arcuato-conjunctis, venis prominentibus laxe reticulatis; receptacula axillaria geminata 2 mm. longe pedunculata globosa 8–10 mm. diam. dense fulvo-hispidula, ostiolo prominente, involucro minuto vix ultra 2 mm. lato patente bilobato, lobis rotundatis, extus dense adpresso-hispidulo.—British Guiana: River banks, Curita, August, 1924, *A. C. Persaud 100* (type in Herb. Field Mus.). Malali, Demerara River, 1922, *De La Cruz 2699*. Kaietur Falls, Potaro River, *De La Cruz 4459*. Upper Mazaruni River, *De La Cruz 2400*.

Vernacular name Kumaka-balli. An exceptionally well marked species, noteworthy for the abundant, harsh pubescence investing almost all parts of the plant.

Ficus Mexiae Standl., sp. nov.—Arbor 10-metralis, ramulis crassis densissime annulatis ferrugineis glabris; stipulae deciduae anguste triangulares 2 cm. longae attenuato-acutae extus minutissime obscure tomentellae vel fere omnino glabrae, intus glabrae; folia majuscula breviter petiolata coriacea glabra, petiolo crasso 1.3–2 cm. longo; lamina anguste oblanceolato-oblonga 11–20 cm. longa 4–7 cm. lata, apice obtusa vel rotundata et interdum subapiculata, basin versus longe sensim attenuata, basi ipsa anguste rotundata et emarginata vel breviter cordata, supra in sicco fuscescens opaca, nervis venisque prominulis pallidis, subtus paullo pallidior, costa crassa elevata pallida, nervis lateralibus utroque latere circiter 16 angulo lato divergentibus fere rectis pallidis prominentibus versus marginem irregulariter arcuato-conjunctis, venulis inconspicuis vix prominulis laxe reticulatis; receptacula axillaria geminata sessilia globosa glabra maculata, 10–14 mm. diam., ostiolo prominulo, involucro bilobato glabro circiter 8 mm. lato patente vel adpresso, lobis late rotundatis.—Brazil: State of Minas Geraes, Fazenda de Aguada, Viçosa, on stream bank, December 24, 1930, *Ynes Mexia 5447* (type in Herb. Field Mus.).

Local name Matapau. Noteworthy for the large, very long and narrow leaves, broadest toward the apex.

Ficus mima Standl., sp. nov.—Arbor 6-metralis omnino glabra, ramulis crassiusculis ferrugineis, novellis striatis, internodiis brevibus; stipulae angustae caducae longiattenuatae 3 cm. longae brunneae; folia mediocria petiolata chartacea, petiolo gracili 1.5–2.5 cm. longo; lamina anguste elliptico-oblonga 11–15 cm. longa 3.5–5 cm. lata sensim acuminata, acumine acuto, basi acuta, supra in sicco pallide viridis laevis, costa nervisque prominentibus, subtus fere concolor, in sicco paullo brunnescens, costa crassa elevata pallida, nervis lateralibus utroque latere circiter 17, altero teneriore parallelo inter paria interposito, prominentibus angulo lato divergentibus pallidis juxta marginem arcuato-conjunctis, venulis inconspicuis vix prominulis; receptacula axillaria geminata 3 mm. longe pedunculata globosa microscopice puberula 5–6 mm. diam., ostiolo prominulo parvo, involucro parvo vix ultra 2 mm. lato glabro ut videtur obscure bilobato sed fere integro.—Brazil: State of Matto Grosso, on shore of creek, source of the Jatuarana River, Machado River region, December, 1931, *B. A. Krukoff 1640* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

In general appearance, particularly in form and color of the leaves and in the long, narrow stipules, this plant has every indication of belonging to the subgenus *Pharmacosycea.* However, if one may depend upon the character of geminate receptacles, it is referable actually to the subgenus *Urostigma,* in which it is not approached closely by any other species. The receptacles in the type material probably are not fully mature.

Ficus panurensis Standl., sp. nov.—Ramuli crassi in sicco nigrescentes glabrati, novellis non visis, internodiis brevibus; stipulae non visae; folia mediocria breviter petiolata crasse coriacea, petiolo crasso circiter 1.5 cm. longo tomentello vel glabrato; lamina anguste oblonga vel obovato-oblonga 8–12 cm. longa 3.5–5 cm. lata subacuta ad obtusissima, basin versus paullo angustata, basi ipsa obtusa et plus minusve obliqua, supra in sicco fusca glabra sublucida, costa nervisque insigniter impressis, subtus brunnescens, praesertim ad nervos venasque pilis longiusculis laxis fulvidis pilosa, costa gracili valde elevata, nervis lateralibus utroque latere 7–10 angulo semirecto vel paullo latiore adscendentibus elevatis subarcuatis juxta marginem irregulariter arcuato-junctis, venulis prominentibus laxe reticulatis, margine subrecurvo; receptacula axillaria geminata sessilia globosa 1 cm. diam. dense velutine brunneo-pilosa, ostiolo prominente, involucro adpresso 7 mm. lato bilobato extus dense strigoso vel glabrato intus glabro ferrugineo, lobis rotundatis.—Brazil: Panuré ad Rio Uaupés, 1852–53, *R. Spruce 2768* (type in Herb. Field Mus.).

A species apparently well marked by its leaf form and densely hairy receptacles. It was distributed by Spruce as a new species, under a now untenable name.

Ficus popayanensis Standl., sp. nov.—Ramuli crassi cinnamomei subdense hirtelli, internodiis brevibus; stipulae fuscae anguste triangulares circiter 13 mm. longae longiattenuatae minute puberulae caducae; folia inter minora petiolata coriacea, petiolo crasso 1.5–2.5 cm. longo glabro; lamina oblongo-obovata 5.5–8.5 cm. longa 2.5–4.5 cm. lata, apice rotundata vel obtusissima et interdum obscure late apiculata, basin versus paullo angustata, basi ipsa cuneato-acutiuscula, supra in sicco fusco-brunnescens sublucida, nervis venisque prominulis, utrinque glabra, subtus fere concolor, costa crassa elevata, nervis lateralibus utroque latere 8–11, altero tenuiore parallelo inter paria interposito, angulo lato divergentibus teneris fere rectis versus marginem arcuato-conjunctis, receptacula axillaria geminata crasse 2–3 mm. longe pedunculata subglobosa, juvenilia 4 mm. tantum diam., glabra vel glabrata, ostiolo plano magno, involucro bilobato 5 mm. lato extus sparse scaberulo vel fere glabro, lobis late rotundatis.—Colombia: Víbora, Central Andes of Popayán, 1,300–1,600 meters, *F. C. Lehmann 5608* (type in Herb. Field Mus.).

At maturity the receptacles are probably somewhat or even much larger than described, for all those seen appear to be very young. The youngest ones are almost enclosed in the comparatively large involucre.

Ficus ramiflora Standl., sp. nov.—Arbor epiphytica subscandens (?), ramis crassissimis ochraceis teretibus glabris, internodiis brevissimis; stipulae ferrugineae caducae glabrae 3 cm. longae vel ultra longiacuminatae; folia magna breviter petiolata coriacea, petiolo crassissimo glabro 1 cm. longo vel paullo ultra; lamina anguste oblanceolato-oblonga in sicco complicata 14–21 cm. longa 3–5.5 cm. lata abrupte anguste acuminata, acumine attenuato, basin versus longe sensim attenuata, basi ipsa obtusa vel acutiuscula, glabra, supra in sicco fusco-brunnescens sublucida, costa venisque non elevatis, subtus paullo pallidior brunnescens, costa crassa elevata, nervis lateralibus utroque latere circiter 15 angulo lato adscendentibus arcuatis non elevatis juxta marginem arcuato-conjunctis, venulis fere obsoletis laxe reticulatis; receptacula omnia ut videtur e nodis ramorum vetustiorum et geminata 4 mm. longe pedunculata globosa 5–7 mm. diam. glabra, ostiolo subprominente, involucro patente ferrugineo vix ultra 3 mm. lato minutissime puberulo vel fere glabro, lobis late rotundatis.—Brazil: State of Amazonas, Humayta, near Tres Casas, on low terra firma, September–October, 1934, *B. A. Krukoff 6446* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

An exceptionally distinct species, unique among representatives of the genus in the Amazon Basin in having the receptacles all borne upon old, leafless branches.

Ficus regularis Standl., sp. nov.—Arbor 25-metralis, ramulis crassis in sicco angulatis brunneis glabris, internodiis brevibus vel saepius elongatis; stipulae caducae triangulares ferrugineae acuminatae 8 mm. longae vel ultra; folia majuscula longipetiolata subcoriacea glabra, petiolo glabro gracili 2.5–4.5 cm. longo; lamina oblongo-elliptica vel subobovato-elliptica, supra medium saepe paullo latior, 11–19 cm. longa 5.5–8 cm. lata abrupte breviter acuminata, basi obtusa vel subacuta, supra opaca, costa nervisque prominentibus, subtus fere concolor brunnescens, costa gracili elevata, nervis lateralibus utroque latere circiter 10 angulo latiusculo adscendentibus leviter arcuatis vel fere rectis gracilibus prominentibus prope marginem arcuato-junctis, venulis vix prominulis plerumque transversis crebris et parallelis; receptacula axillaria geminata crasse 5–6 mm. longe pedunculata subglobosa vel pyriformi-globosa 12–14 mm. longa ut videtur viridia glabra, ostiolo magno prominente, involucro bilobato patente vix 4 mm. lato extus sparse strigoso vel fere glabro, pedunculo interdum hispidulo, lobis involucri rotundatis.—Brazil: Territory of Acre, near mouth of Rio Macauhan, a tributary of Rio Yaco, on terra firma, August 14, 1933, *B. A. Krukoff 5488* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.). Amazonas, near mouth of Rio Embira, on varzea land, June, 1933, *Krukoff 5005*.

Ficus sphenophylla Standl., sp. nov.—Arbor 12-metralis omnino glabra, ramulis crassis striatis fusco-brunnescentibus, internodiis brevissimis; stipulae caducae ferrugineae circiter 1 cm. longae attenuatae; folia mediocria petiolata coriacea, petiolo crassiusculo 1.5–2 cm. longo; lamina cuneato-oblonga 8.5–11 cm. longa 3–5 cm. lata, apice late rotundata et breviter apiculato-acuminata vel interdum fere truncata, basin versus longe cuneatim attenuata, basi ipsa obtusa vel subacuta, supra in sicco griseo-brunnescens opaca, nervis venisque non elevatis, subtus brunnescens, costa gracili elevata, nervis lateralibus utroque latere circiter 19, aliis 3 tenerioribus inter paria interpositis, tenerrimis obscuris angulo lato fere recto divergentibus, fere rectis, prope marginem in nervum collectivum subregularem conjunctis, venulis obsoletis; receptacula axillaria et geminata, saepe e nodis inferioribus defoliatis nascentia, interdum pluria quam 2 e nodo, 2–3 mm. longe pedunculata globosa glabra vix ultra 5 mm. diam. maculata, ostiolo magno plano, involucro bilobato glabro adpresso 4 mm. lato, lobis late rotundatis.—Brazil: Territory of Acre, on terra firma near mouth of Rio Macauhan, a tributary of Rio Yaco, August 9, 1933, *B. A. Krukoff 5384* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Well marked by the large, cuneiform leaves with very numerous lateral nerves and obscure venation.

Ficus Sprucei Standl., sp. nov.—Ut videtur omnino glabra, ramulis subgracilibus brunneis, internodiis plus minusve elongatis;

stipulae non visae; folia parva petiolata firme coriacea, petiolo gracili 1–2 cm. longo; lamina obovato-oblonga vel oblanceolato-oblonga 4–9.5 cm. longa 1.8–3.5 cm. lata, apice obtusa ad late rotundata, basin versus sensim angustata, basi ipsa acuta vel subacuta, supra in sicco fuscescens sublucida, nervis venisque non elevatis, subtus fusco-brunnescens, costa gracili elevata, nervis lateralibus utroque latere circiter 12 angulo latiusculo abeuntibus tenerrimis prominulis prope marginem arcuato-conjunctis, venulis prominulis laxe reticulatis; receptacula axillaria geminata crasse 2 mm. longe pedunculata 3–4 mm. diam. globosa glabra, ostiolo plano, involucro bilobato glabro vix 2 mm. lato, lobis rotundatis.—Brazil: Prope Panuré ad Rio Uaupés, 1852–53, *R. Spruce 2804* (type in Herb. Field Mus.), *2499.*

The numbers were distributed by Spruce as a new species, under an untenable name. The receptacles are perhaps the smallest borne by any American species of *Ficus.*

Ficus tolimensis Standl., sp. nov.—Ramuli crassi teretes densissime pilis breviusculis ferrugineis hirsuti, internodiis brevibus; stipulae evolutae non visae, ut videtur parvae latae dense hirsutae; folia majuscula petiolata subcoriacea, petiolo 5–25 mm. longo crasso dense hirtello; lamina late oblongo-obovata vel rotundato-obovata 10.5–15.5 cm. longa 5.5–10.5 cm. lata, apice late rotundata vel obtusissima, basi anguste rotundata et emarginata, supra fuscescens asperrima ubique dense hirtella, nervis venisque prominulis, subtus concolor, dense subvelutine hirtella, costa crassiuscula elevata, nervis lateralibus utroque latere circiter 11 irregularibus angulo lato divergentibus fere rectis prominentibus juxta marginem irregulariter arcuato-junctis, venulis prominentibus reticulatis; receptacula axillaria geminata crasse vix ultra 2 mm. longe pedunculata ovalia, circiter 18 mm. longa et 12 mm. lata, basi et apice rotundata, densissime fulvo-hirtella, ostiolo parvo prominente, involucro parvo bilobo ferrugineo extus dense strigoso, lobis vix 3 mm. longis apice late rotundatis.—Colombia: Dolores, Department of Tolima, 500–1,400 meters, *F. C. Lehmann 5805* (type in Herb. Field Mus.).

An exceptionally well distinguished species, remarkable for the large and very rough leaves, and especially for the large, oval or oblong, densely hairy receptacles.

Ficus uberrima Standl., sp. nov.—Arbor epiphytica fere glabra, ramulis crassiusculis ferrugineis rugosis sparse minute strigillosis vel fere glabris, internodiis superioribus brevissimis; stipulae caducae angustae longiattenuatae 2.5 cm. longae extus minutissime puberulo-tomentellae; folia mediocria petiolata subcoriacea, petiolo gracili 2–3 cm. longo in statu juvenili sparse obscure puberulo cito glabrato; lamina oblonga interdum apicem versus paullo latior 9–18 cm. longa 4–6.5 cm. lata, apice rotundata vel obtusa et subito caudato-acuminata, acumine fere lineari 1–1.5 cm. longo, basi obtusa vel subacuta, supra in sicco griseo-viridis sublucida glabra, costa crassa elevata, nervis venisque prominulis, subtus brunnescens, glabra vel glabrata, vel in statu juvenili obscure minute puberula, basi triplinervia, costa gracili elevata, nervis lateralibus utroque latere circiter 14, altero paullo tenuiore inter paria nervorum primariorum et eis parallelo interposito, tenerrimis angulo lato abeuntibus subarcuatis vel fere rectis prope marginem arcuato-junctis, venulis obscuris laxe reticulatis; receptacula axillaria geminata arcte sessilia globosa dense minute puberulo-tomentella circiter 8 mm. diam., ostiolo magno valde elevato, involucro subadpresso 6–8 mm. lato bilobato ferrugineo extus minute puberulo, lobis apice late rotundatis.—Brazil: State of Amazonas, near mouth of Rio Embira, a tributary of Rio Tarauaca, June 28, 1933, *B. A. Krukoff 5055* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

The rather handsome leaves are almost exactly oblong in outline, the acumination abrupt, narrow, and markedly elongate. The fruits are densely crowded near the apices of the branches.

Ficus ursina Standl., sp. nov.—Arbor 15-metralis, trunco 50 cm. diam., ramulis crassis brunneis in sicco subangulatis densissime fulvo-hirsutis, internodiis elongatis; stipulae deciduae circiter 1 cm. longae vel ultra longiacuminatae ferrugineae extus adpresso-hirsutae; folia mediocria petiolata fragilia membranacea, petiolo 1–3 cm. longo dense hirsuto; lamina oblanceolato-oblonga 10–17 cm. longa 3.5–6 cm. lata subabrupte anguste acuminata, acumine obtuso, basin versus paullo angustata, basi ipsa anguste rotundata vel truncata et interdum emarginata, supra in sicco fusca asperrima subdense hirtello-scabra, costa nervisque prominulis, subtus fere concolor brunnescens ubique sed praesertim ad costam breviter hirsuta, costa gracili elevata, nervis lateralibus utroque latere circiter 17 prominentibus teneris leviter arcuatis angulo latiusculo adscendentibus prope marginem arcuato-conjunctis, venulis prominentibus sed inconspicuis laxe reticulatis; receptacula axillaria geminata arcte sessilia depresso-globosa 12–14 mm. lata densissime molliter fulvo-pilosa, ostiolo majusculo glabro subdepresso, involucro bilobato

7 mm. lato ferrugineo adpresso extus piloso, lobis apice late rotundatis.—Brazil: Territory of Acre, on terra firma, near mouth of Rio Macauhan, a tributary of Rio Yaco, August 29, 1933, *B. A. Krukoff 5686* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Related to *F. juruensis* Warb., of the same general region, which differs decidedly in leaf form, especially in the much fewer lateral nerves, and also in its somewhat smaller, not depressed fruits.

Olmedia boyacana Standl., sp. nov.—Arbor 12–18-metralis, trunco 10–15 cm. diam., ramulis gracilibus in sicco fuscis dense adpresse sordido-pilosulis, internodiis brevibus; stipulae lineari-triangulares 6–7 mm. longae ferrugineae caducae extus adpresse ferrugineo-pilosae; folia inter minora breviter petiolata subcoriacea, petiolo crassiusculo 6–7 mm. longo dense fulvo-strigoso; lamina anguste lanceolato-oblonga 6.5–13 cm. longa 2–3.5 cm. lata subabrupte longiattenuata, acumine angusto plus minusve falcato apice acuto, basi oblique acuta, supra in sicco fuscescens, tantum ad costam subimpressam pilosula aliter glabra opaca, subtus fere concolor primo dense fulvo-strigosa cito glabrata, costa gracili elevata, nervis lateralibus utroque latere circiter 13 angulo lato adscendentibus arcuatis gracilibus prominentibus marginem attingentibus, venulis prominulis laxe reticulatis; capitula mascula axillaria geminata 5–7 mm. longe pedunculata globosa dense multiflora circiter 8 mm. diam., pedunculo dense hirtello ut videtur plus minusve recurvo, bracteis numerosis ovatis obtusis dense strigillosis, floribus dense puberulis, antheris longe exsertis.—Colombia: Region of El Humbo, State of Boyacá, on high, forested slopes, 1,350 meters, May 10, 1933, *A. E. Lawrance 791* (type in Herb. Field Mus.).

Similar to *O. tovarensis* Klotzsch, in which the leaves have much shorter acuminations and a more abundant, soft, more or less spreading pubescence on the lower surface.

Perebea concinna Standl., sp. nov.—Arbor 6–21-metralis, ramulis crassiusculis ochraceis vel griseis, novellis ferrugineis dense breviter molliter pilosis, serius glabratis, internodiis subelongatis; stipulae caducae 10–14 mm. longae acuminatae extus dense sericeae ferrugineae; folia magna breviter petiolata coriacea, petiolo crasso 6–15 mm. longo dense ferrugineo-pilosulo vel glabrato; lamina oblonga, oblanceolato-oblonga vel anguste oblonga 11–20 cm. longa 3.5–6.5 cm. lata subito breviter acuminata, acumine lato apice obtuso vel rotundato, basin versus interdum paullo angustata, basi ipsa acuta vel obtusa et saepius paullo inaequali, supra in sicco plus minusve brunnescens vel lutescens laevis glabra sublucida, costa elevata, nervis venisque obscuris non elevatis, subtus fere concolor sublucida glabra, costa bene elevata, nervis lateralibus utroque latere 16–19 angulo lato fere recto divergentibus teneris inconspicuis prominulis fere rectis prope marginem irregulariter arcuato-conjunctis, venulis vix prominulis arcte reticulatis; capitula feminea axillaria geminata vel ut videtur interdum fasciculata brevissime pedunculata, bracteis parvis latissimis obtusis vel subtruncatis adpresso-pilosulis; pedunculus fructifer crassissimus brevis, capitulo fructifero globoso 2.5–3.5 cm. diam., fructibus numerosis dense aggregatis densissime adpresse brunneo-tomentosis irregulariter angulatis.—Brazil: State of Amazonas, Humayta, near Livramento, on Rio Livramento, on terra firma, October–November, 1934, *B. A. Krukoff 6687* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.), *6620*. Amazonas, São Paulo de Olivença, basin of Belem Creek, in 1936, *Krukoff 8955*. State of Matto Grosso, near Tabajaza, upper Machado River region, in 1931, *Krukoff 1492*.

It is not altogether certain that all the collections cited are conspecific, since part of them are not in good condition for study.

Perebea xinguana Standl., sp. nov.—Arbor 16-metralis, trunco 45 cm. diam., ramulis crassis ferrugineis, novellis dense griseo-puberulis, internodiis brevibus; stipulae angustae circiter 1.5 cm. longae anguste attenuatae deciduae extus dense griseo-sericeae; folia magna breviter petiolata firme coriacea, petiolo crasso circiter 2 cm. longo primo dense griseo-puberulo, serius glabrato; lamina oblongo-elliptica 24 cm. longa 12 cm. lata, apice subito caudato-acuminata, acumine angusto attenuato apice obtuso, basi obtusa, supra in sicco griseo-viridis lucida glabra, nervis prominentibus, venulis prominulis, subtus fere concolor in statu juvenili densiuscule fulvo-puberula cito glabrata, in statu adulto fere omnino glabra, costa gracili valde elevata, nervis lateralibus utroque latere circiter 20 prominentibus pallidis angulo lato divergentibus rectis juxta marginem arcuato-conjunctis venulis transversis subparallelis irregularibus connexis, venulis ultimis vix prominulis arctissime reticulatis; receptacula mascula (tantum in statu juvenili visa) axillaria geminata disciformia 8 mm. (vel ultra?) lata dense multiflora, pedunculis inaequalibus ad 1 cm. longis minute puberulis, bracteis numerosis arcte imbricatis late ovatis acutis vel obtusis minute adpresso-pilosulis.—Brazil: State of Pará, in high forest, upper Cupary River, plateau between the Xingu and Tapajos rivers, September, 1931, *B. A. Krukoff 1133* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Vernacular name Muiratinga.

Pourouma elliptica Standl., sp. nov.—Arbor 15-metralis, trunco 11 cm. diam., ramulis crassis densissime fulvo-hirsutis, internodiis brevibus, cicatricibus stipularum paullo obliquis; stipulae caducae angustae 2.5 cm. longae acuminatae extus dense fulvo-hirsutae; folia magna longipetiolata coriacea, petiolo gracili 7–9.5 cm. longo dense breviter hirsuto; lamina elliptica vel oblongo-elliptica 17–30 cm. longa 8.5–16 cm. lata apice anguste rotundata et brevissime apiculata, basi obtusa vel anguste rotundata, supra in sicco brunnescens laevis, primo ad nervos costamque hispidula, serius glabrata, nervis venisque non elevatis, subtus lutescenti-grisea ubique dense adpresse arachnoideo-tomentosa, ad venas nervosque hirtella, costa gracili elevata, nervis lateralibus utroque latere circiter 13 prominentibus angulo semirecto adscendentibus rectis in marginem desinentibus, venis transversis creberrimis parallelis prominentibus; inflorescentia mascula laxe paniculata multiramosa petiolo longior longipedunculata, ramis dense purpureo-ferrugineis puberulo-tomentellis, bracteis brevibus linearibus fulvo-hispidulis.— Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, on high land, September–October, 1936, *B. A. Krukoff 8388* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Vernacular name Mapaty. Well marked by its large, elliptic, entire leaves, rounded or sometimes almost truncate at the apex.

Pourouma ferruginea Standl., sp. nov.—Arbor 13-metralis, trunco 10 cm. diam., ramulis crassissimis densissime ferrugineo-tomentosis; stipulae non visae; folia magna longissime petiolata coriacea, petiolo crasso circiter 18 cm. longo primo ut videtur dense arachnoideo-tomentoso, glabrescente; lamina rotundato-ovata vel late oblongo-ovata 26–35 cm. longa 17–23 cm. lata apice late rotundata et interdum breviter cuspidato-apiculata, basi late rotundata vel saepius breviter (ad 2 cm.) aperte cordata, interdum infra medium obscure trilobata, margine integro vel subundulato, supra in sicco pallide brunnescens laevis glabra vel tantum ad costam nervosque adpresso-hispidula, nervis subimpressis, subtus ubique dense ferrugineo-arachnoideo-tomentosa, basi 5-nervia, costa gracili elevata, nervis lateralibus utroque latere circiter 18 prominentibus rectis angulo recto vel paullo latiore adscendentibus in marginem desinentibus venis transversis prominulis crebris fere rectis connexis; panicula mascula petiolo plus quam duplo brevior laxe multiramosa pedunculata, ramis dense purpureo-ferrugineo-tomentellis, bracteis linearibus fulvo-hispidulis.—Brazil: State of Amazonas, São Paulo de Olivença, basin of Belem Creek, in high forest, terra firma, October–December, 1936, *B. A. Krukoff 8807* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Noteworthy for the bright reddish-ferruginous tomentum of the lower leaf surface, a character not common in the genus. Regarding this tree Mr. Krukoff writes: "Perhaps one of the most interesting plants recently identified by you is No. 8807, *Pourouma ferruginea*. It is apparently quite rare, and although its leaves (reddish underneath) can be seen at a distance, a thorough search of the immediate vicinity failed to produce another individual. The tree provided material for only three sets. I have not seen this tree in any other region except the type locality."

Pourouma isophlebia Standl., sp. nov.—Arbor 18-metralis, trunco 17 cm. diam., ramulis fuscis teretibus striatis, novellis dense pallido-sericeis, internodiis brevissimis, cicatricibus stipularum parum obliquis; stipulae caducae 3.5–4 cm. longae angustae acuminatae densissime lucide fulvo-sericeae; folia parva petiolata coriacea, petiolo gracili 2–3 cm. longo striato supra late canaliculato sericeo; lamina oblongo-obovata vel elliptico-obovata 9–12 cm. longa 4.5–6 cm. lata, apice late rotundata, rare brevissime emarginata, basin versus paullo angustata, basi ipsa obtusa vel acutiuscula, supra in sicco fusco-brunnescens glabra vel tantum ad costam adpresso-pilosa opaca, nervis non elevatis, subtus pallida tomento minuto adpresso cinereo dense induta, ad nervos costamque dense sericea, basi trinervia, costa gracili elevata, nervis lateralibus utroque latere circiter 7 angulo angusto minore quam recto adscendentibus prominentibus gracilibus marginem fere attingentibus venulis transversis crebris fere rectis prominulis connexis, margine integro vel apicem versus subundulato; inflorescentiae femineae axillares 1.5–2 cm. longe pedunculatae simplices et capitatae vel e capitulis 3 pedunculatis paucifloris compositae, pedunculis densissime fulvo-sericeis, perianthio densissime sericeo stigmate magno terminato.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, on high land, September–October, 1936 *B. A. Krukoff 8073* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

Easy of recognition because of the peculiar inflorescence and the small leaves of distinctive form and nervation.

Pourouma Lawrancei Standl., sp. nov.—Arbor 12–15-metralis, trunco 20–30 cm. diam., ramulis crassis in sicco angulatis, novellis minute puberulis, internodiis brevibus, cicatricibus stipularum parum obliquis; stipulae caducae magnae latiusculae 7 cm. longae acutae minutissime puberulo-tomentellae; folia magna longipetiolata coriacea, petiolo gracili 8–10 cm. longo minute puberulo striato; lamina ovata vel late ovata 17–24 cm. longa 10.5–16 cm. lata apice obtusa vel subacuta et brevissime apiculata, basi late rotundata vel subtruncata et emarginata, supra in sicco brunnescens laevis glabra vel tantum ad costam sparse adpresso-hirsuta, nervis non elevatis, subtus pallida ubique densiuscule adpresse albido-arachnoideo-tomentosa, basi 5-nervia, costa gracili elevata, nervis lateralibus utroque latere circiter 14 angulo semirecto adscendentibus rectis in marginem desinentibus venulis crebris transversis prominulis fere rectis connexis, margine integro vel subundulato; inflorescentia mascula laxe corymboso-paniculata petiolo fere aequilonga repetite ramosa longipedunculata, ramis densissime ferrugineo-tomentellis, bracteis parvis linearibus vel filiformibus ferrugineo-tomentellis.—Colombia: Region of El Humbo, State of Boyacá, along stream, 900 meters, March 31, 1933, *A. E. Lawrance 727* (type in Herb. Field Mus.).

Vernacular name Cormi. "Flowers white with brown stamens; wood used in hut construction; a black staining substance is contained in the inner bark of stem and in the leaves."

Pourouma Mildbraediana Standl., sp. nov.—Arbor 21-metralis, trunco 22 cm. diam., ramulis crassis subteretibus longitrorsum corrugatis densissime breviter pilosulis et sparse hirsutis ferrugineis, internodiis brevissimis, cicatricibus stipularum non obliquis; stipulae magnae coriaceae ferrugineae latiusculae 5.5–6.5 cm. longae rugosae glabrae vel fere glabrae caducae; folia majuscula longipetiolata coriacea, petiolo circiter 4.5 cm. longo dense ochraceo-sericeo; lamina ovata vel late ovata 14–18 cm. longa 9–12 cm. lata obtusa, basi late rotundata vel subcordata, supra in sicco brunnescens asperrima ubique scaberula, nervis non elevatis, subtus pallidior griseo-brunnescens ubique minute adpresse albido-tomentosa, ad costam nervosque sericea, ad venulas interdum hirtella, basi 5–7-nervia, costa valde elevata, nervis lateralibus utroque latere circiter 13 angulo semirecto adscendentibus rectis in marginem desinentibus venulis transversis crebris valde arcuatis prominentibus connexis, margine subundulato; inflorescentia mascula densiuscule cymoso-paniculata petiolo plus minusve longior longipedunculata repetite ramosa multiflora, pedunculo crassiusculo atque ramis primariis dense ochraceo-sericeis, ramis ultimis dense ferrugineo-tomentellis, floribus aggregatis, bracteis linearibus ferrugineo-tomentellis.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, on high land, September-October, 1936, *B. A. Krukoff 8386* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Pourouma populifolia Standl., sp. nov.—Arbor 13-metralis, trunco 12 cm. diam., ramulis crassis in sicco subangulatis ferrugineis sparse fulvo-hirsutis, internodiis superioribus brevissimis, cicatricibus stipularum paullo obliquis; stipulae angustae caducae 8.5 cm. longae acutae ferrugineae extus arachnoideo-tomentosae et hirsutae intus glabrae; folia inter minora longipetiolata coriacea, petiolo gracili 4-8 cm. longo puberulo et sparse hirsuto vel glabrato; lamina ovata vel late ovata 7.5-12.5 cm. longa 6-8.5 cm. lata anguste acuminata, basi rotundata vel obtusa, supra in sicco fusco-brunnescens glabra vel tantum ad costam adpresso-hirsuta, opaca, nervis non elevatis, subtus pallidior brunnescens ubique tomento minuto arcte adpresso densiuscule induta, ad nervos sparse strigosa, basi trinervia, costa gracili elevata, nervis lateralibus utroque latere circiter 11 angulo semirecto adscendentibus rectis marginem attingentibus venulis transversis prominulis crebris fere rectis connexis, margine integro vel paullo undulato; inflorescentia feminea petiolo aequilonga vel longior longipedunculata laxe multiflora, pedunculo puberulo vel fere glabro apice trichotomo, ramis densissime molliter fulvo-pilosulis, capitulis umbellatis paucifloris, pedicellis crassis circiter 5 mm. longis; fructus ovoideus 10-14 mm. longus basi rotundatus apice contractus dense puberulo-tomentellus apice stigmate coronatus.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, on varzea land, September-October, 1936, *B. A. Krukoff 8427* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

Vernacular name Mapaty. Similar to *P. longipendula* Ducke, also of the Amazon Valley, which has peduncles more than twice as long, and lacks the hirsute pubescence of *P. populifolia*.

Pourouma subplicata Standl., sp. nov.—Arbor 27-metralis, ramulis crassiusculis in sicco subangulatis, cicatricibus stipularum parum obliquis, internodiis superioribus brevissimis, novellis dense fulvo-sericeis; stipulae caducae angustae 5.5 cm. longae extus densissime lucide fulvo-sericeae, acutae, intus glabrae ferrugineae; folia inter minora petiolata firme coriacea, petiolo 1.5–3.5 cm. longo gracili striato dense sericeo; lamina ovali-oblonga vel obovato-oblonga vulgo supra medium paullo latior 10.5–16.5 cm. longa 4.5–8 cm. lata, apice obtusa vel rotundata, basin versus paullo angustata, basi ipsa obtusa, supra in sicco brunnescens lucida glabra vel ad costam sericea, nervis subimpressis, subplicata, subtus multo pallidior, ubique dense pilis brevibus subadpressis fulvis pilosula sed vix tomentosa, ad costam nervosque sericea, basi trinervia, costa crassiuscula elevata, nervis lateralibus utroque latere circiter 13 angulo semirecto vel paullo angustiore adscendentibus rectis marginem attingentibus elevatis gracilibus venulis transversis creberrimis fere rectis prominulis connexis, margine apicem versus undulato; inflorescentiae femineae capituliformes axillares 4–5 cm. longe pedunculatae, pedunculo simplici fulvo-sericeo, capitulis paucifloris, floribus sessilibus, perianthio angusto circiter 1 cm. longo densissime pilis brevibus mollibus subadpressis vel patentibus lutescentibus lucidis induto, stigmate magno convoluto ferrugineo terminato.—Brazil: Territory of Acre, near mouth of Rio Macauhan, a tributary of Rio Yaco, on terra firma, August 4, 1933, *B. A. Krukoff 5282* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Pourouma umbellata Standl., sp. nov.—Arbor 16–21-metralis, ramulis subgracilibus teretibus vel in sicco plus minusve angulatis, vetustioribus brunneis, novellis dense arctissime ochraceo-sericeis, internodiis superioribus brevibus, cicatricibus stipularum parum obliquis; stipulae caducae angustae 5–9 cm. longae acuminatae ferrugineae extus densissime lucide fulvo-sericeae intus glabrae; folia inter minora petiolata coriacea, petiolo gracili 2–3.5 cm. longo fulvo-sericeo; lamina oblongo-elliptica vel obovato-oblonga, medio vel paullo supra medium latissima, 9.5–17 cm. longa 4–7.5 cm. lata subabrupte anguste acuminata, acumine apice obtuso, basi obtusa vel subacuta, supra in sicco brunnescens sublucida glabra vel tantum ad costam adpresso-hirsuta, nervis non elevatis, subtus pallida ubique minute adpresse tomentulosa, ad costam nervosque sericea, basi trinervia, costa gracili elevata, nervis lateralibus utroque latere circiter 12 angulo semirecto vel paullo angustiore adscendentibus rectis marginem attingentibus venulis transversis crebris paullo arcuatis prominulis connexis, margine integro vel apicem versus paullo undulato; inflorescentia feminea axillaris crasse 4–4.5 cm. longe pedunculata, floribus 3–5-umbellatis 1–1.5 cm. longe pedicellatis, perianthio ovoideo 1.5–2 cm. longo dense minute sericeo, basi obtuso, apicem versus acuminato-angustato.—Brazil: State of Amazonas, Humayta, on plateau between Rio Livramento and Rio Ipixuna, on terra firma, November, 1934, *B. A. Krukoff 7071* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.). Amazonas, Manicore, near Santa Fe, September, 1934, *Krukoff 6041*.

In form of the inflorescence this is much like *P. isophlebia*, described above, but in that the leaves are rounded rather than acuminate at the apex.

Pseudolmedia Krukovii Standl., sp. nov.—Arbor 9-20-metralis, trunco 10-17 cm. diam., ramulis crassiusculis, vetustioribus griseis, novellis ferrugineis minute puberulis vel fere omnino glabris, internodiis brevibus; stipulae triangulares vix ultra 5 mm. longae acuminatae deciduae sparse minute strigillosae vel glabratae; folia mediocria breviter petiolata coriacea, petiolo crassiusculo 4-6 mm. longo ferrugineo glabrato; lamina anguste oblanceolato-oblonga 8.5-14 cm. longa 2.5-4 cm. lata subabrupte caudato-acuminata, acumine angusto obtuso usque 1.5 cm. longo, basin versus paullo angustata, basi ipsa acuta vel obtusa et plus minusve inaequali, glabra, supra in sicco subgrisea opaca, nervis prominulis, subtus pallidior brunnescens, costa gracili elevata, nervis lateralibus utroque latere circiter 12 angulo fere recto divergentibus valde arcuatis, remote a margine irregulariter arcuato-conjunctis, venulis prominulis laxe reticulatis; capitula mascula parva plerumque e nodis defoliatis nascentia breviter pedunculata vel fere sessilia recurva subglobosa 5-6 mm. longa, bracteis rotundato-ovatis obtusis vel apice rotundatis puberulis late imbricatis, exterioribus gradatim brevioribus, antheris ultra bracteas bene exsertis.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, on high land, September-October, 1936, *B. A. Krukoff 8159* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.), *8341*.

Pseudolmedia Murure Standl., sp. nov.—Arbor 11-metralis, trunco 15 cm. diam., ramulis gracilibus griseis teretibus, novellis ferrugineis glabris vel sparsissime minute strigillosis, internodiis brevibus; stipulae angustae caducae brunneae circiter 1 cm. longae dense lucide fulvo-sericeae; folia mediocria breviter petiolata coriacea, petiolo 6-10 mm. longo crassiusculo glabro vel glabrato; lamina elliptico-oblonga circiter 14 cm. longa atque 6 cm. lata abrupte breviter acuminata, acumine obtuso, basi obtusa vel anguste rotundata et paullo obliqua, glabra, supra in sicco brunnescens sublucida, venulis minute reticulatis vix prominulis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere circiter 18 angulo lato divergentibus paullo arcuatis gracilibus prominentibus prope marginem eleganter arcuato-conjunctis venulis transversis remotis subparallelis vix prominulis connexis; capitula feminea 1-flora axillaria ut videtur solitaria sessilia vix ultra 4 mm. longa, bracteis numerosis ferrugineis rotundato-ovatis obtusis, exterioribus gradatim brevioribus, extus sparse minute sericeis, stylo bracteis plus quam duplo longiore.—State of Maranhão, road to Gurupy, Carutapera, on terra firma, January 30, 1933, *R. Froes 2023* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Vernacular name Murure. "Bark used to cure rheumatism, and for nerves."

NYCTAGINACEAE

Neea aeruginosa Standl., sp. nov.—Arbor 12-metralis, trunco 10 cm. diam., ramulis subteretibus crassiusculis dense breviter fusco-villosulis, internodiis 3.5–8 cm. longis; folia opposita magna breviter petiolata subcoriacea, petiolo crasso 8–15 mm. longo dense breviter ferrugineo-villosulo; lamina oblongo-elliptica 12–21 cm. longa 6–9.5 cm. lata, apice subrotundata vel obtusa et subito in acumen acutum usque 1.5 cm. longum contracta, basi obtusa vel anguste rotundata, supra in sicco fusca sublucida glabra, costa nervisque conspicuis sed vix elevatis, venis manifestis, subtus fusca tactu asperula, ubique breviter ferrugineo-puberula, ad costam breviter villosula, costa crassiuscula elevata, nervis lateralibus utroque latere circiter 8 remotis irregularibus angulo lato adscendentibus valde arcuatis versus marginem irregulariter arcuato-conjunctis, venis vix prominulis laxe reticulatis; inflorescentia feminea terminalis dense multiflora cymoso-paniculata 1.5–2 cm. longe pedunculata circiter 2 cm. longa et aequilata pauciramosa, basi trichotoma, ramis crassis densissime ferrugineo-villosis, bracteis ovato-oblongis vix ultra 3 mm. longis obtusis dense villosulis, floribus congestis sessilibus; perianthium late tubulosum fere 5 mm. longum glabratum vel tantum prope basin ferrugineo-puberulum, lobis subpatentibus latis obtusis circiter 1 mm. longis; stylus breviter exsertus.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, varzea land, September–October, 1936, *B. A. Krukoff 8578* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Neea Mexiae Standl., sp. nov.—Frutex patens 2.5 m. altus, ramis gracilibus pilis sordidis rigidis dense longihirsutis, internodiis elongatis 4–10 cm. longis; folia inter maxima opposita vel ternata breviter petiolata membranacea, petiolo crasso 1.5 cm. longo hirsuto;

lamina oblongo-elliptica 21–29 cm. longa 9–11.5 cm. lata acuminata, acumine ipso acuminato, basi acuta vel subabrupte acuminata, supra in sicco fusca, primo sparse pilis longis patentibus hirsuta, cito glabrata, subtus praesertim ad costam longe hirsuta, aliter sparse hirsuta vel glabrata, costa crassiuscula elevata, nervis lateralibus utroque latere circiter 13 tenuibus angulo lato adscendentibus arcuatis; inflorescentia feminea ut videtur dependens longissime (ad 20 cm. longe) pedunculata, cymoso-paniculata thyrsoideo-pyramidalis 8 cm. longa et fere aequilata, pedunculo dense longihirsuto, ramis paniculae reflexis dense hirsutis, floribus breviter crasse pedicellatis, bracteis filiformibus hirtellis usque 5 mm. longis persistentibus numerosis; perianthium roseo-brunneum 8–10 mm. longum 3–4 mm. latum glabrum vel obscure sparse puberulum, ore contractum, dentibus triangularibus acutis vix ultra 0.5 mm. longis.—Ecuador: Near Tena, 400 meters, in dense forest, April, 1935, *Ynes Mexia 7151* (type in Herb. Field Mus.; duplicate in U. S. Nat. Herb.).

Remarkable for the very large leaves, and the exceptionally copious, hirsute pubescence densely investing the branches and peduncles.

Neea Krukovii Standl., sp. nov.—Arbor 20-metralis, ramulis crassis subteretibus fuscis glabris vel ad nodos sparse puberulis; folia 3–5-verticillata vel hinc inde alterna petiolata magna chartacea valde inaequalia, petiolo gracili 1.5–2.5 cm. longo glabro; lamina oblonga vel anguste oblonga 9–18 cm. longa 3.5–5.5 cm. lata obtuse acutata, basi acuta et obliqua, glabra, supra in sicco lucida fusco-olivacea, costa nervisque prominulis, nervulisque quoque prominulis atque laxe reticulatis, subtus opaca fusca, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 15 angulo lato divergentibus fere rectis versus marginem reticulato-conjunctis, nervulis prominulis laxe reticulatis; inflorescentia terminalis paniculata 3.5 cm. longe pedunculata ca. 7 cm. longa et 8 cm. lata, ramis crassis subpatentibus dense minute sordido-puberulis, floribus dense aggregatis arcte sessilibus; fructus immaturus 7 mm. longus clavato-oblongus glaber.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, near Livramento, on terra firma, October–November, 1934, *B. A. Krukoff 6836* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

A species noteworthy for the large and exceptionally narrow leaves, very lustrous on the upper surface, and almost coriaceous in texture.

Neea madeirana Standl., sp. nov.—Arbor 21–28-metralis, ramulis crassis subteretibus vel plus minusve obtuse angulatis, densissime rufo-tomentulosis, internodiis brevibus; folia magna ad apices ramulorum subverticillata petiolata valde inaequalia papyracea, petiolis crassiusculis 1.5–2.5 cm. longis dense rufo-tomentosis; lamina obovata, obovato-elliptica vel late elliptica 7–34 cm. longa 4.5–12.5 cm. lata, apice rotundata vel obtusa vel breviter acutata, basi acuta ad subrotundata, interdum abrupte decurrens, supra in sicco lucida, primo dense rufo-tomentosa serius glabrata, nervulis prominulis arcte reticulatis, subtus opaca densius rufo-tomentosa, tomento plus minusve persistente, costa crassa elevata, nervis lateralibus utroque latere ca. 12 adscendentibus crassiusculis prominentibus subarcuatis in marginem desinentibus, nervulis prominentibus reticulatis; inflorescentia (immatura et altera fructifera tantum visae) parva petiolo paullo longior pedunculata densissime multiflora, floribus sessilibus vel subsessilibus, undique densissime rufo-tomentosa; panicula fructifera ca. 6 cm. lata; fructus maximus ovalis 18 mm. longus 12 mm. latus basi et apice late rotundatus dense rufescenti-tomentulosus.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, on plateau between Rio Livramento and Rio Ipixuna, on campinarana, November, 1934, *B. A. Krukoff 7066* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.). Also *No. 6902*, collected near Livramento.

Vernacular name, João Mole. An exceptionally well marked species, noteworthy for the large, broad leaves and the copious, rusty tomentum found on all parts of the plant.

Reichenbachia colombiana Standl., sp. nov.—Frutex 2–3-metralis vel ultra, ramis vetustioribus teretibus striatis ochraceis, novellis gracilibus dense minute stellato-tomentulosis, internodiis brevibus; folium unum sine dubio valde depauperatum tantum visum, fere sessile late ellipticum 8 mm. longum 5 mm. latum subobtusum basi obtusum, supra dense minute stellato-puberulum, subtus pallidius dense stellatim ochraceo-tomentosum; flores cymosi vel ad nodos fasciculato-subumbellati, inflorescentiam elongatam angustam efformantes, pedicellis fructiferis gracilibus 4–7 mm. longis patenti-pilosis; perianthium anguste tubulosum ca. 8 mm. longum 1–1.5 mm. latum basi acutiusculum obscure costulatum, dense stellato-pilosulum et pilis longioribus patentibus pilosum, dentibus anguste oblongis 4–5 subpatentibus ca. 2 mm. longis obtusis; stamina tubo paullo breviora, filamentis gracilibus glabris, antheris 1 mm. longis; stylus inferne dense stellato-pilosus; fructus ovoideus fere

2 mm. longus prope basin glaber vel glabratus, apicem versus paullo angustatus et dense stellato-pilosus.—Colombia: Arroyo de Piedras and Luruaco, in a clearing along a trail, April 5, 1936, *Armando Dugand G. 979* (type in Herb. Field Mus.).

This species represents a most remarkable and unexpected addition to the flora of Colombia. In the most recent treatment of the Nyctaginaceae by Heimerl in the *Pflanzenfamilien*, a single species is recognized in the genus *Reichenbachia*, *R. hirsuta* Spreng. of Matto Grosso, Paraguay, and Argentina. That has a minute, closely appressed, silvery, stellate pubescence suggestive of the indument that characterizes many members of the Elaeagnaceae. The present plant has a quite different pubescence, of relatively lax and long hairs, easily visible to the naked eye. In other respects the plants are similar, so far as can be observed, and evidently congeneric. The available material of *R. colombiana* bears, unfortunately, only a single and doubtless abnormal and greatly reduced leaf. It is likely that well developed leaves of the northern plant will reveal other differential characters.

CARYOPHYLLACEAE

Silene chihuahuensis Standl., sp. nov.—Herba elata erecta vel basi decumbens ca. 60 cm. alta, caule viridi tereti glabro tantum ad vel prope nodos sparse villoso, internodiis plerumque foliis longioribus; folia opposita membranacea, superiora sessilia, inferiora in petiolum 5 mm. longum alatum contracta, ovata vel late elliptico-ovata 6–8.5 cm. longa 3–5 cm. lata acuminata vel longiacuminata, basi abrupte in petiolum contracta et late obtusa vel rotundata, superiora basi subcordata, in sicco laete viridia, supra praesertim prope basin sparse breviter pilosa, ciliata, subtus ad costam pilosa, minute pallido-puncticulata, nervis lateralibus plerumque prope basin nascentibus; inflorescentia laxe anguste thyrsoideo-paniculata 20 cm. longa 8 cm. lata, ramis primariis plerumque trifloris suberectis pilis brevibus albidis plus minusve viscidis subdense villosis, bracteis foliis similibus sed minoribus, pedicellis terminalibus gracilibus usque 3 cm. longis, floribus subnutantibus; calyx subinflatus campanulatus 1.5 cm. longus fere 1 cm. latus subdense albido-villosus albidus viridi-nervosus, basi rotundatus, lobis late ovatis tubo plus quam duplo brevioribus obtusis vel acutiusculis trinerviis, marginibus hyalinis; petala ut videtur alba 2.5 cm. longa longe unguiculata, lamina lata basi late cuneata in lacinias fere 1 cm. longas angustissimas apice fere filiformes partita.—Mexico: Chuichupa, Chihua-

hua, moist, shaded canyon, August-September, 1936, *Harde LeSueur 637* (type in Herb. Field Mus.).

A handsome plant with large flowers and broad leaves, not closely similar to any other Mexican species of the genus.

CRUCIFERAE

Selenia mexicana Standl., sp. nov. Herba subacaulis annua vel biennis, caulibus valde abbreviatis vix ultra 1 cm. longis, planta ubique glabra; folia numerosa pallide viridia ut videtur rosulata usque 7 cm. longa bipinnatim dissecta, segmentis parvis lineari-oblongis acutiusculis, rhachi primaria angustissime marginata, petiolis basin versus plus minusve dilatatis vaginantibus; pedunculi axillares graciles ad 2 cm. longis saepe flexuosis vel recurvis; siliqua subsessilis oblongo-ovalis 17-23 mm. longa 8-9 mm. lata, apice late rotundata, basi obtusa, anguste marginata, stylo persistente basi valde incrassato vix ultra 2 mm. longo, valvis enerviis; semina disciformia orbicularia hilo emarginata lucida dense punctata fuscescentia 5-6 mm. diam., marginata sed vix alata.—Mexico: Rare on the plain, Arroyo Hondo, Hacienda San José de Raíces, Municipio de Galeana, State of Nuevo León, August 1, 1935, *C. H. Mueller 2327* (type in herb. Arnold Arb.; fragment in Herb. Field Mus.).

This is the fourth species of *Selenia* to be described, the others ranging from southern Missouri to Arkansas, Oklahoma, Texas, and eastern New Mexico. The Mexican plant is most closely related to *S. dissecta* Torr. & Gray, in which the seeds are broadly and conspicuously winged, and the style much more elongate and slender.

CAPPARIDACEAE

Capparis Millei Standl., sp. nov.—Arbor pulchra 6-8-metralis, ramulis novellis olivaceis in sicco subangulatis densissime minute molliter puberulis, internodiis brevibus vel paullo elongatis; folia majuscula longipetiolata subcoriacea, petiolo gracili 1-4.5 cm. longo dense minute puberulo; lamina oblonga vel elliptico-oblonga 7-12 cm. longa 2.5-7.5 cm. lata apice late rotundata et brevissime apiculata vel interdum emarginata, basi anguste rotundata vel obtusa, supra in sicco laete viridis glabra, nervis manifestis sed non elevatis, subtus glaucescens ubique dense pilis albidis brevibus subpatentibus pilosula, costa gracili prominente, nervis lateralibus utroque latere ca. 8 angulo latiusculo adscendentibus subarcuatis remote a margine arcuato-junctis, venulis manifestis arcte reticulatis; inflorescentia terminalis corymbiformi-racemosa longipedunculata, floribus numerosis, pedicellis gracilibus suberectis ca. 3 cm. longis puberulis; calyx (perfectus non visus) patens glandulis 4 magnis auctus; corolla in alabastro globoso-ovoidea apice rotundata, petalis latis fere 1 cm. longis dense minute puberulis; stamina numerosa torta violacea longissima; gynophorum in statu fructifero ca. 6.5 cm. longum puberulum; bacca immatura subglobosa ca. 13 mm. longa basi et apice rotundata sparse puberula vel fere glabra.—Ecuador: In sylvis regionis tropicae prope Guayaquil, September–October, 1936, *Luis Mille 898* (type in Herb. Field Mus.).

HAMAMELIDACEAE

Hamamelis mexicana Standl., sp. nov.—Frutex usque 3.5 m. altus, ramulis vetustioribus teretibus brunnescenti-ochraceis glabratis obscure rimosis lenticellis paucis elevatis conspersis, annotinis brevibus crassis 1.5–2.5 cm. longis conspicue nodosis dense adpresse tomento ochraceo indutis, nodis 4–7, novellis similiter tomento brunnescente indutis; folia ad anthesin persistentia crasse membranacea, petiolis solemniter inaequalibus, foliorum inferiorum 8–10 mm. tantum longis, foliorum apicalium 2–2.5 cm. longis, densissime minute stellato-tomentellis; lamina ambitu rotundato-obovata 5.5–7.5 cm. longa 4–6 cm. lata, apice obtusa vel rotundata, basin versus interdum subcuneatim angustata, basi ipsa valde inaequali, latere interiore 3–4 mm. breviore, margine insigniter sinuato-undulato, lamina supra in sicco fusca subdense minute stellato-pilosula, pilis non intertextis, nervis subimpressis, subtus densissime pilis paullo majoribus stellatis ochraceis mollibus pilosa, costa gracili elevata, nervis lateralibus utroque latere 5–6 angulo recto vel angustiore adscendentibus rectis marginem attingentibus, venulis manifestis prominulis laxe reticulatis; flores aestivales; pedunculi e nodis annotinis nascentes crassi 3–4 mm. longi dense stellato-tomentosi plerumque triflori; calyx ca. 4 mm. longus extus densissime stellato-tomentosus, intus glaber, lobis ovalibus apice rotundatis; petala pallide lutea liguliformia 10–13 mm. longa paullo ultra 1 mm. lata glabra, apice anguste rotundata vel subtruncata.—Mexico: Abundant along the bank of an arroyo, "just beyond west puerto, Potrero Redondo to west to Puerto de la Laguna Sánchez and beyond," Municipio de Villa Santiago, State of Nuevo León, in flower, July 5, 1935, *C. H. Mueller 2116* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

The large collection of plants obtained in 1935 in the State of Nuevo León, Mexico, by Mr. C. H. Mueller, forwarded for determination to the writer through the courtesy of Dr. Alfred Rehder, has

proved to contain a surprisingly large number of plants of much more than ordinary interest. Some indicate unexpected extensions of range, others are second collections of species known previously only from the type collection, a large number are new, and several, like this *Hamamelis*, represent new generic records for Mexico.

Of all these noteworthy plants none has so much interest or was so unexpected as *Hamamelis mexicana.* At first glance it was assumed to be a quite distinct new species, as was to be presumed from the fact that it is far isolated from the nearest known occurrence of the genus, in Oklahoma and eastern Texas. Such cases of interrupted distribution are, however, not unknown in the Mexican flora, as might be proved by the citation of a considerable number of herbaceous and woody plants. More careful study led me to believe that the Mexican plant was probably only a variety of *H. vernalis* Sarg., which it resembles in many respects—in fact, most of the species of this small genus are much alike in superficial characters, although apparently well enough distinguished if examined by one who understands the characters by which they are best separated.

Dr. Edgar F. Anderson kindly examined the Mexican collection, and pointed out its distinctive characters, stating his belief that it was sufficiently distinct to be rated as a species. He indicated its close relationship to *H. macrophylla* Pursh, which it resembles in leaf shape and especially in the distinctive form of the flowering branches, i.e., those of the preceding year.

The most easily perceptible character of *H. mexicana* is the greatly elongate petiole of the terminal leaf of each branchlet. Although such an elongation is suggested in a few of the United Species specimens, usually there is no indication of it at all, and never does it reach the degree seen in the Mexican shrub.

No notes are given by the collector regarding the habit of *H. mexicana,* so it is not known whether the bushes grow in clumps and produce suckers, as in *H. vernalis,* or whether they are isolated and suckerless, as in *H. virginiana.* The time of flowering, in midsummer of the North, midway between *H. vernalis* on the one hand and *H. virginiana* and *H. macrophylla* on the other, is curious, but rather natural. Apparently *H. mexicana* is essentially vernal in flowering, the blossoms opening after the summer rains, which in New Mexico and northeastern Mexico produce a climatic condition comparable with that produced in the North by the spring increase in temperature.

ROSACEAE

Prunus novoleontis Standl., sp. nov.—Arbor 11-metralis, trunco 25 cm. diam., ramulis gracilibus ferrugineis pallido-lenticellatis, novellis hirtellis; folia mediocria breviter petiolata papyracea, petiolo 1–1.5 cm. longo dense ferrugineo-piloso; lamina elliptico-oblonga vel oblongo-ovata 5–10.5 cm. longa 3–4.5 cm. lata obtusa vel acuta, basi plus minusve inaequilaterali obtusa vel subrotundata, dense crenato-serrata, serraturis angustis valde incurvis, supra in sicco fusca lucida glabra, costa subimpressa, venulis prominulis arcte reticulatis, subtus pallidior rufescens, ubique dense pilis brevibus rufescentibus hirsuta, costa gracili prominente, nervis lateralibus utroque latere ca. 10 angulo latiusculo adscendentibus arcuatis; flores racemosi, racemis lateralibus ramos foliatos breves terminantibus pedunculatis laxe multifloris ca. 9 cm. longis dense pilosis, pedicellis fructiferis 5–8 mm. longis patentibus sparse pilosis vel glabratis; calyx sub fructum persistens 5–6 mm. latus patens glabratus; drupa globosa in sicco 8 mm. diam. glabra apice rotundata et apiculata.—Mexico: Common along various arroyos, Potrero Redondo west to Puerto de la Laguna Sánchez and beyond, Municipio de Villa Santiago, State of Nuevo León, July 5, 1935, *C. H. Mueller 2118* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

From both of the related species, *P. Capuli* Cav. and *P. virens* (Woot. & Standl.) Standl., this differs in the dense pubescence of the lower leaf surface.

Prunus Gentryi Standl., sp. nov.—Arbor, ramulis ferrugineis rugosis, novellis olivaceis minutissime fere microscopice puberulis, internodiis brevissimis; folia parva petiolata papyracea, petiolo gracili 7–9 mm. longo glabro; lamina oblongo-lanceolata 3.5–4.5 cm. longa 12–17 mm. lata apicem acutum vel subobtusum versus sensim attenuata, basi obtusa vel anguste rotundata, integra, supra in sicco olivacea sublucida glabra, costa subimpressa, nervis obsoletis, subtus paullo pallidior glabra, costa gracili prominente, nervis lateralibus utroque latere ca. 8 arcuatis obscuris, venis obsoletis, margine prope basin utroque latere glandulis 1 vel 2 onusto; flores racemosi, racemis axillaribus efoliatis pedunculo brevi incluso 3–3.5 cm. longis laxe pauci- vel multifloris, axi striato sparse minute pilosulo vel fere glabro, pedicellis crassis 4–5 mm. longis patentibus; calyx sub fructum persistens reflexus ca. 7 mm. latus, lobis ovalibus apice rotundatis viridescentibus glabris integris vel remote dentatis; drupa ovoidea 7–9 mm. longa apice subangustata glabra.—Mexico: Sierra Canelo, Río Mayo, Sonora, in pine-oak country, growing by a stream, August 30, 1936, *Howard Scott Gentry 2514* (type in Herb. Field Mus.).

The Warihío name is reported as Wasiki. The fruit is eaten; the wood is employed for tool handles. The relationship of the species is with the large-leaved *P. rhamnoides* Koehne of Mexico.

LEGUMINOSAE

Lonchocarpus Lindsayi Standl., sp. nov.—Ramuli crassi fusco-ferruginei teretes, novellis glabris pallide elevato-lenticellatis dense foliatis; folia parva petiolata, petiolo cum rhachi 5.5–7.5 cm. longo glabro supra canaliculato; foliola circiter 11, 1–2 mm. longe petiolulata late ovata, ovalia vel oblongo-elliptica 1–2.5 cm. longa 7–13 mm. lata apice rotundata vel late obtusa et saepius brevissime emarginata, basi obtusa vel rotundata, crasse membranacea, glabra, supra cinereo-viridia opaca, costa subimpressa, nervis obsoletis, subtus fere concoloria, costa gracili elevata, venulis obscuris minute reticulatis; racemi axillares simplices pedunculati foliis longiores laxe multiflori usque 12 cm. longis, rhachi sparse minute puberula vel fere glabra, pedicellis 2–3 mm. longis; calyx glaber latissime campanulatus 2.5 mm. longus 4 mm. latus, margine integro vel subintegro; petala glabra, vexillo 8 mm. longo et aequilato apice retuso; legumen anguste oblongum valde compressum 3–5.5 cm. longum 10–12 mm. latum glabrum apice acutum vel rotundatum et abrupte breviter rostratum, basi acutum, sessile, marginibus tenuibus nullo modo incrassatis; semina vulgo 1–3.—Panama: Back of Bejuco, November 7, 1936, *Walter L. Lindsay 446* (type in Herb. Field Mus.). Also *No. 399*, collected at the same locality (in flower) July 27, 1936.

Distinct from most other species of the region in its exceptionally small and very obtuse or rounded leaflets.

Parosela scoparia (Gray) Heller, f. **Arsenei** Standl., f. nov.—A forma typica petalis violaceis insigni non nisi corolla alba differt.—New Mexico: Four miles north of Bernalillo, 1,600 meters, September 4, 1927, *Brother G. Arsène 18988* (type in Herb. Field Mus.).

This broom-like, usually leafless shrub, a characteristic plant of the lower desert region of New Mexico, bears normally rather handsome, violet flowers. An aberrant form with pure white flowers was scarcely to be expected.

RUTACEAE

Amyris Marshii Standl., sp. nov.—Frutex vel arbor omnino glabra, ramulis crassis teretibus fuscis rugosis lenticellatis, novellis olivaceis dense glanduloso-punctatis, internodiis brevibus; folia parva breviter petiolata subcoriacea in sicco olivacea utrinque fusco-glanduloso-punctata, petiolo 5–13 mm. longo; lamina in sicco saepe complicata ovata vel elliptico-ovata 4–6.5 cm. longa 2–3.3 cm. lata, apicem obtusum vel acutum versus angustata, basi obtusa vel rotundata, supra sublucida, venis prominulis, subtus concolor, costa gracili prominente, nervis lateralibus utroque latere ca. 7 angulo latiusculo adscendentibus arcuatis prope marginem arcuato-junctis, venulis prominulis arcte reticulatis, margine integro; inflorescentia terminalis paniculata pedunculata circiter 4 cm. longa atque 3 cm. lata subdense multiflora erecta, ramis primariis brevibus angulo lato adscendentibus, bracteis late ovatis acutis minus quam 1 mm. longis, floribus aggregato-cymosis sessilibus vel brevissime crasse pedicellatis; calyx 1 mm. longus 1.5 mm. latus brevissime remote dentatus, dentibus latis acutiusculis, dense glanduloso-punctatus; petala ovalia vel late oblonga dense punctata 2.5–3 mm. longa apice rotundata glabra; stamina inaequalia petala aequantia, filamentis glabris crassiusculis, antheris parvis subglobosis; ovarium glabrum.—Mexico: Muzquiz, Coahuila, Spring of 1935, *Ernest G. Marsh 66* (type in Herb. Field Mus.); July, 1936, *Marsh 253* and *307*.

Related to *A. monophylla* Brandeg., of Oaxaca and Puebla, which differs in having shorter-petiolate leaves, smaller inflorescences, and rounded calyx lobes.

DICHAPETALACEAE

Dichapetalum chiapasense Standl., sp. nov.—Ramuli crassiusculi angulati fuscescentes, novelli minute fulvo-tomentulosi vel glabrati, internodiis brevibus paullo ultra 1 cm. longis; folia mediocria breviter petiolata coriacea, petiolo crasso 5–8 mm. longo tomentuloso vel glabrato; lamina anguste lanceolato-oblonga 8.5–12.5 cm. longa 2–3.5 cm. lata sensim longiacuminata, basin versus paullo angustata, basi ipsa anguste rotundata vel obtusa et paullo inaequali, supra in sicco fusco-olivacea, glabra vel ad costam paullo tomentulosa, costa impressa, nervis prominulis, subtus concolor primo ad nervos venasque sparse pilosa serius fere glabra, costa gracili elevata, nervis lateralibus utroque latere circiter 9 prominentibus pallidis arcuatis remotis angulo latiusculo adscendentibus remote a margine arcuato-conjunctis, venulis prominulis pallidis laxe reticulatis; inflorescentiae parvae pauci- vel multiflorae foliis duplo breviores, ramis crassis dense fulvo-tomentulosis, floribus breviter crasse pedicellatis; fructus magnus 1–2-locularis, 1-locularis late ovalis vel subglobosus 2 cm. longus et 1.5 cm. latus vel ultra, 2-locularis rotundato-obovatus circiter 2 cm. longus et aequilatus, densissime adpresse fulvo-tomentulosus.—Mexico: Mount Orando, Chiapas, December 24, 1936, *E. Matuda 679* (type in herb. Univ. Michigan; fragment in Herb. Field Mus.).

This is the first representative of the family Dichapetalaceae to be recorded from Mexico. It is related to *D. Donnell-Smithii* Engler, common and widely distributed in Central America, which differs in its considerably broader leaves with much more abundant pubescence, and in its usually smaller fruits.

EUPHORBIACEAE

Manihot isoloba Standl., sp. nov.—Frutex gracilis 2–5-metralis omnino glaber, ramis crassiusculis teretibus ferrugineis, novellis glaucis sat dense foliatis; stipulae filiformes breves caducae; folia majuscula longipetiolata membranacea, petiolo gracili 5.5–12 cm. longo plus minusve glauco; lamina 5–11 cm. longa et aequilata, fere ad basin 5–9-partita, supra laete viridis, subtus glauca vel glaucescens, lobis inaequalibus, exterioribus brevioribus, oblongo-linearibus, lateribus fere parallelis, ca. 1 cm. latis, apice obtuso ad acuminato subito in acumen protracto-filiforme usque 7 mm. longum contractis, integris; flores masculi racemosi, racemis fere sessilibus ad 2.5 cm. longis paucifloris, pedicellis gracilibus glaucis ad 13 mm. longis, bracteis brevibus glauco-viridibus linearibus vel oblongis; calyx anguste campanulatus 12 mm. longus, lobis ovalibus obtusis tubo paullo brevioribus intus glabris, alabastris apice rotundatis vel obtusis; flores feminei in axillis supremis inserti vel racemum brevem efformantes; capsula globosa exalata 1.7 cm. longa glauca; semina grisea lucida laevia ca. 1 cm. longa atque 8 mm. lata.—Mexico: Guasaremos, Río Mayo, Chihuahua, growing with oaks, August 10, 1936, *Howard Scott Gentry 2372* (type in Herb. Field Mus.). Bakachaka, Río Mayo, Sonora, rocky hill slopes, July, 1935, *Gentry 1468*.

Local name Pata de gallo. "A slender, many-stemmed shrub; leaves blue-green." A well marked species because of its distinctive leaf form, the narrow lobes being all almost equal in breadth, with nearly parallel sides.

Phyllanthus Purpusii Brandeg. Univ. Calif. Publ. Bot. 6: 185. 1915.

Based upon material collected by C. A. Purpus on Cerro del Boquerón, Chiapas, Mexico. A second collection has been examined recently: Mount Orando, Chiapas, December, 1936, *E. Matuda 523* (herb. Univ. Michigan; fragment in Herb. Field Mus.).

AQUIFOLIACEAE

Ilex Rimbachii Standl., sp. nov.—Arbor 15-metralis, trunco 50 cm. diam., ramulis crassis subteretibus fuscis striatis densissime pilis sordidis patentibus pilosis, internodiis brevibus; folia parva brevissime petiolata coriacea, petiolo crasso vix 3 mm. longo; lamina late ovalis vel ovalis, interdum ovato-ovalis, 3.5–4.5 cm. longa 2–3.5 cm. lata apice rotundata et apiculata vel obtusa, basi rotundata, subintegra vel remote adpresse spinuloso-serrata, supra in sicco fusca lucida, primo dense breviter pilosa glabrescens, nervis non elevatis, subtus concolor ubique dense pilis sordidis patentibus rigidulis pilosa, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 6 angulo lato divergentibus fere rectis remote a margine arcuato-junctis, venulis obscuris laxe reticulatis, margine vulgo recurvo; flores feminei axillares solitarii vel geminati, pedunculis gracilibus 5–8 mm. longis dense pilosis; calyx sub fructum persistens adpressus 5 mm. latus, lobis triangularibus acutis dense breviter pilosis; fructus globosus ca. 6 mm. diam. apice late rotundatus et mammillatus dense sordido-pilosus.—Ecuador: Forest region above Balsapampa, 2,600 meters, August, 1936, *Rimbach 789* (Yale No. 32979; type in Herb. Field Mus.).

"A forest tree 15 meters high, the trunk 50 cm. thick; young stems velvety-hairy; fruit upon a 5-lobed calyx, globular, 8 mm. thick, black-red, with a few seeds. Wood moderately hard, white; bark smooth, gray, with medium-sized, round warts." The species is noteworthy for the small, broad, thick-coriaceous leaves, and for the abundant, spreading pubescence that covers almost all parts.

MALVACEAE

Callirrhoe sidalceoides Standl., sp. nov.—Caulis visus 20 cm. tantum longus ut videtur decumbens simplex dense stellato-hirtellus, internodiis foliis paullo longioribus; folia longipetiolata herbacea, petiolo ca. 2.5 cm. longo subsparse stellato-hirtello; lamina ambitu reniformis ca. 3.5 cm. longa 4.5 cm. lata ad medium subaequaliter 5-loba, basi late cordata, sinu aperto acutiusculo, lobis profunde trilobis, lobis lateralibus iterum bilobis, terminali trilobo, lobis ultimis oblongo-ovatis obtusis, lamina supra dense albido-punctata et hispido-strigosa, subtus subsparse stellato-hispidula, pilis 2–4-radiatis albidis; flores axillares solitarii, pedunculis 3–7.5 cm. longis unifloris dense stellato-hirtellis; bracteae paullo infra basin calycis insertae lineares hispidulae calyce duplo breviores; calyx 1.5 cm. longus extus dense pilis simplicibus et stellatis intermixtis hispidulus fere ad basin lobatus, lobis lanceolatis tubo triplo longioribus longe angustissime attenuatis prominente trinerviis; petala ut videtur purpurea 2.5 cm. longa extus glabra.—Mexico: Muzquiz, Coahuila, Spring of 1935, *Ernest G. Marsh 100* (type in Herb. Field Mus.).

The plant, unfortunately, is known only from a single and scant specimen, but the characters it exhibits seem to differentiate it from all species known from the general region in which it grows.

BOMBACACEAE

Millea Standl., gen. nov.—Arbores procerae inermes, radicibus tuberculos magnos emittentibus; folia alterna longipetiolata digitata, foliolis membranaceis sessilibus crenatis; flores parvi hermaphroditi dense pilosi in paniculas laxas multifloras repetite ramosas dispositi; calyx cupulatus truncatus; stamina circiter 20, columna brevi angusta, filamentis in margine disci columnae insertis liberis filiformibus erectis glabris 1-antheriferis subaequalibus, antheris parvis reniformibus; petala libera extus dense retrorso-pilosa angusta; ovarium 5-loculare; capsula parva crasse coriacea vel sublignosa 5-valvis, loculis intus densissime lanatis; semina pauca oblique ovoidea lana endocarpii involuta, hilo laterali, testa crustacea laevi.

The genus represented by this unusual tree is clearly a most distinct one. It belongs in the alliance of *Bombax*, *Ceiba*, etc., where it is well distinguished by the very small flowers, disposed in large panicles, by the closely serrate leaflets, and the curious, small capsules. It is dedicated to Rev. Luis Mille, S. J., who has devoted many years and much labor to investigation of the still imperfectly known flora of Ecuador, especially that of the coastal region lying about Guayaquil.

Millea ecuadorensis Standl., sp. nov.—Ramuli crassi glabri vel sparse puberuli in sicco fusco-ferruginei; folia magna longipetiolata, petiolo crassiusculo 11–28 cm. longo tereti sparse patentipiloso brunnescente; foliola ca. 6 sessilia membranacea obovata vel elliptico-obovata subinaequalia, circiter 20 cm. longa atque 8.5 cm. lata vel minora, abrupte breviter acuminata, acumine vix ultra 1 cm. longo, basin versus sensim longe cuneato-attenuata, basi ipsa acuta vel acuminata, in toto margine arcte crenata, supra in sicco viridia aspera ubique sparse hirtello-scabra, nervis manifestis sed non elevatis, subtus paullo pallidiora ubique subdense pilis simplicibus patentibus molliter pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 16 angulo lato divergentibus subarcuatis prope marginem laxe reticulato-conjunctis, venulis inconspicuis laxe reticulatis; panicula crasse 9 cm. longe pedunculata ca. 18 cm. lata et paullo brevior, floribus numerosissimis, ramis ferrugineis minute griseo-stellato-tomentulosis, floribus cymosis vel breviter racemosis, pedicellis crassiusculis 3–12 mm. longis minute tomentellis; calyx late cupulatus 2.5 mm. longus fere 5 mm. latus truncatus extus minute tomentellus, intus sericeus; petala oblongo-linearia 1.5 cm. longa vix ultra 2 mm. lata obtusa intus sericea, extus densissime pilis albis retrorsis adpressis sericeis induta; columna staminea 4 mm. longa glabra; filamenta ca. 1 cm. longa, antheris ca. 0.3 mm. diam.; stylus ca. 13 mm. longus glaber; capsula subdepresso-globosa 2 cm. longa, apice late rotundata vel subtruncata et apiculata brunnea laevis lucida, valvulis ca. 1 cm. latis intus subrugosis, lana laete rufa; semina ca. 7 mm. longa opaca nigra, maculis elongatis pallidioribus notata.—Ecuador: In regione tropice "sabana" prope Guayaquil, in flower, July–August, 1936, *Luis Mille 885* (type in Herb. Field Mus.). Portovelo, *Rose & Rose 23371.*

Vernacular name Chirigua. Father Mille has forwarded two of the smaller tubercles, which are subglobose and about 10 cm. in diameter, hollow, and densely covered with dark, irregular, imbricate scales. He states that some of the tubercles attain a much greater size. Rose reported the local name of "polopolo."

FLACOURTIACEAE

Hasseltia guatemalensis Warb. in Engl. & Prantl, Nat. Pflanzenfam. III. Abt. 6a: 32. 1893.

Apparently a little known but amply distinct species of this small genus. The following collection, constituting a new species record for Mexico, appears to agree well with the type as represented by a photograph in the Herbarium of Field Museum: Siltepec, Chiapas, January, 1937, *E. Matuda 385* (herb. Univ. Michigan).

CARICACEAE

Jarilla Chocola Standl., sp. nov.—Herba simplex omnino glabra; folia longissime petiolata membranacea, petiolo gracili 7–20 cm. longo; lamina ambitu late ovato-rotundata, saepe latior quam longa, 6–16 cm. longa, 6–20 cm. lata, saepius breviter triloba, interdum elobata, margine grosse irregulariter dentato vel dentato-lobato, lobis apice acutis vel acuminatis, lamina basi truncata vel

concava 3-5-nervia, supra viridis, subtus glaucescens; inflorescentiae masculae axillares solitariae 15-23 cm. longe pedunculatae, cymosae, congestae, pauci- vel multiflorae ca. 3 cm. longae, floribus sessilibus vel breviter pedicellatis; calyx minutus vix 1 mm. longus; corolla alba, tubo 6 7 mm. longo superne paullo dilatato, fauce 2 mm. lato, lobis oblongis obtusis patentibus 5-6 mm. longis obtusis; antherae breviter exsertae; flores feminei axillares solitarii 3-4 mm. longe pedunculati recurvi; fructus juvenilis late globoso-ovoideus fere 2 cm. longus, apice rotundatus et subito 3 mm. longe rostratus, basi subtruncatus et appendicibus 5 fere spiniformibus ca. 3 mm. longis retrorsis appendiculatus.—Mexico: Guasaremos, Río Mayo, Chihuahua, shaded slopes, often under *Guazuma ulmifolia* and other lowland trees with grass and shrubs, August 10, 1936, *Howard Scott Gentry 2366* (type in Herb. Field Mus.); at the same locality, August 5, 1935, *Gentry 1553.* San Bernardo, Río Mayo, Sonora, valley forest, August 24, 1935, *Gentry 1624.*

Vernacular names Chócola and Kapiáh (Warihío names). Although clearly referable to the endemic Mexican genus *Jarilla,* this plant is altogether unlike the two other species of the genus, particularly in leaf form. Regarding this curious and apparently local plant, the collector supplies the following information:

"Chiefly from memory I will tell you what I can of *Jarilla Chocola.* It is a leafy, succulent, and fast-growing annual, less than a meter in height, single-stemmed, and with white flowers. It apparently germinates with the first of the summer rains (presumably the plant is a perennial from a fleshy root, the stems dying to the ground each year—P. C. S.), for I found it with flowers and immature fruit the first part of August. It is a shade-adapted plant, living its short term under the steaming foothill forest trees, which in summer are casting their fullest shade. It seems fairly hardy, for in close competition there are a number of species, such as *Acalypha* sp., *Rivina humilis, Gronovia scandens, Priva aspera,* and others, forming an association of forest summer underlings.

"Its span of life is short. No sooner have the warm rains passed than the plant wilts and dies under the strong September sun. Its last moments are spent in maturing its fruit. All through the long fall until long after the death of the parent plant, the traveler will chance upon the fruits lying scattered upon the ground, or shoaled along the margins of the lesser washes where some sudden rain water has borne them. Nor has the fruit suffered the least decomposition upon its dank, earthy bed, as with so many of the fleshy, thinskinned fruits, but rather seems to partake of the renewed moisture and lies fresh, plump, and firm in the hand. It was thus that I first discovered it, and searched in vain for the plant that bore it, to the then misunderstood humor of my native companion.

"The fruit is oval, 6–7 cm. in length by 3–4 cm. in diameter, deciduous from its stalk. It bears several ribs moderately tubercled or irregularly crenate. Its pulp is a light, white, pudding-like mass of slightly acidulous flavor remotely suggestive of lemon. Centrally are imbedded half a hundred or more seeds. Some of the Mexicans and Indians evince a real liking for the fruit. Its cool tartness is refreshing, and an attachment can be readily understood, when one remembers that taste can be bent with a little hunger and courage to a new flavor.

"I have been told that the root is thick and fleshy and good to eat when roasted. Among the Warihíos it is one of the important wild food plants, carrying them over the hunger period before the corn harvest. The name chócola is used by the Mexicans for the fruit. The root they speak of as cápida, a corruption of the Warihío name for the plant, kapiáh."

MYRTACEAE

Eugenia hiraeifolia Standl., sp. nov.—Ramuli crassi griseo-ferruginei ut videtur in statu juvenili minute pallido-tomentelli, internodiis 4.5–5.5 cm. longis; folia breviter petiolata firme chartacea, petiolo ca. 7 mm. longo minutissime albido-tomentello vel glabrato; lamina late obovata vel oblongo-obovata 12–14 cm. longa 6–8 cm. lata, apice late rotundata vel fere truncata et breviter apiculato-acuminata vel interdum apice obtuso subacuta, basin versus sensim cuneato-angustata, basi ipsa anguste obtusa, supra in sicco viridis glabra, costa subimpressa, nervis manifestis et fere planis, subtus paullo pallidior, in statu juvenili ut videtur minute adpresso-tomentella sed in adulto fere omnino glabra, ubique minute obscure punctata, costa gracili elevata, nervis lateralibus utroque latere ca. 11 angulo fere recto adscendentibus fere rectis remote a margine irregulariter arcuato-conjunctis, venulis prominulis laxe reticulatis; flores ut videtur in cymas axillares paucifloras crasse 2 cm. longe pedunculatas dispositi; bacca magna late ovali-obovata 2.5 cm. longa 1.8 cm. lata, basi paullo angustata, apice late rotundata et calyce persistente coronata, lobis calycis late rotundatis brevibus.—Panama: Monte Oscuro, near Panama City, September 23, 1935, *James Zetek 3550* (type in Herb. Field Mus.).

The available material is not as ample as might be desired, and, unfortunately, with fruit only. The large, broad leaves indicate a species, perhaps referable to some other genus than *Eugenia*, that is unlike anything previously known from the region of the Isthmus.

Eugenia nesiotica Standl., sp. nov.—Frutex, in statu florifero defoliatus, ramis gracilibus teretibus cinnamomeis rimosis, novellis griseo-puberulis vel subsericeis, internodiis brevibus; folia parva breviter petiolata crasse papyracea, petiolo vix ultra 2.5 mm. longo puberulo; lamina lanceolato-oblonga vel lanceolato-elliptica 4–5 cm. longa 12–20 mm. lata subabrupte longiacuminata, acumine angusto apice obtuso, basi obtusa vel acuta, utrinque ad costam puberula vel subsericea, aliter glabra vel glabrata, supra in sicco griseo-viridis opaca, subtus concolor, punctis pellucidis sat densis sed vix obviis, costa tenera prominente, nervis lateralibus utroque latere ca. 13 tenerrimis vix manifestis angulo lato divergentibus fere rectis remote a margine arcuato-junctis, venulis obscuris arcte reticulatis; flores in axillis fasciculati numerosi, pedicellis plerumque 5–6 mm. longis gracilibus pilis albidis subpatentibus pilosulis; hypanthium dense albido-tomentulosum; sepala paullo ultra 2 mm. longa rotundata puberula vel glabrata punctata; petala rotundata 3.5 mm. longa glabra marginibus minute ciliolata dense punctata.—Panama: Barro Colorado Island, Canal Zone, in 1936, *James Zetek 3646* (type in Herb. Field Mus.; in bud only); April 28, 1937, *Zetek 3835* (flowers).

ONAGRACEAE

Gaura Gentryi Standl., sp. nov.—Herba erecta ca. 60 cm. alta, caule gracili superne subumbellato-ramoso, rubro tincto, dense minute cinereo-puberulo et subdense pilis longis pallidis usque 5 mm. longis patentibus piloso, laxe foliato; folia breviter petiolata membranacea, petiolo gracili ad 8 mm. longo; lamina lanceolato-linearis 4.5–6 cm. longa 4–10 mm. lata apicem versus longe sensim attenuata, basi attenuato-acuta, remote breviter repando-dentata, supra dense minute pilosa tactu sericea, subtus concolor dense minute sericeo-pilosula et sparse praesertim ad costam longihirsuta; flores spicati, spicis longipedunculatis 3–11 cm. longis remotifloris, floribus paucis vel numerosis arcte sessilibus, rhachi dense incurvo-puberula; ovarium 8 mm. longum fere lineare dense griseo-incurvo-puberulum; calyx extus dense puberulus in alabastro subacuminatus, tubo gracillimo 2–2.5 cm. longo vix 1 mm. crasso, lobis linearibus 2 cm. longis 3 mm. latis; petala pallide lutea ca. 2 cm. longa glabra; filamenta ca. 17 mm. longa glabra, antheris linearibus 5 mm. longis;

fructus immaturus oblongo-ovoideus 8 mm. longus 4 mm. latus grosse obtuse costatus griseo-incurvo-puberulus.—Mexico: Guasaremos, Río Mayo, Chihuahua, on rocky outcroppings, September 26, 1935, *Howard Scott Gentry 1859* (type in Herb. Field Mus.).

"The pale yellow flowers open in the evening, and in the sunshine hang wilted and closed. Observed later on Cerro Güicorichi." The relationship of this large-flowered plant is with the Mexican *G. mutabilis* Cav. (represented in the Herbarium of Field Museum by authentic material) and *G. grandiflora* Rose, described from Chihuahua. If pubescence may be relied upon for separating species of *Gaura*, which is somewhat doubtful, the present plant is amply distinct from both those species in the close, incurved pubescence of the ovaries and fruit. In *G. grandiflora* the fruit is glabrous; in *G. mutabilis* densely pilose with spreading hairs.

Hauya Lundellii Standl., sp. nov.—Arbor 23-metralis, trunco 35 cm. diam., ramulis ochraceis plus minusve nodosis, novellis viridibus sparse minute puberulis cito glabratis, internodiis brevibus; folia mediocria petiolata subcoriacea, petiolo gracili 1–3 cm. longo sparse obscure puberulo vel glabro; lamina anguste oblanceolato-oblonga vel anguste elliptico-oblonga 7–12.5 cm. longa 2.5–4.5 cm. lata sensim vel subabrupte acuminata vel acuta, basin versus saepius longe angustata, basi ipsa acuta vel acuminata et plus minusve inaequali, integra vel paullo undulata, supra in sicco griseo-viridis glabra elevato-puncticulata, nervis manifestis sed non elevatis, subtus paullo pallidior, glabra vel ad costam sparse hinc inde pilosa, costa gracili pallida elevata, nervis lateralibus utroque latere 7–8 angulo lato adscendentibus valde arcuatis, venulis laxe reticulatis; flores axillares solitarii crasse usque 6 mm. longe pedunculati, ovario glabro angusto 13 mm. longo; calyx extus glaber pallide viridis, tubo circiter 4 cm. longo medio 3 mm. lato, fauce dilatato, lobis 3.5 cm. longis apice non appendiculatis subobtusis lineari-lanceolatis; capsula anguste clavata 4–4.5 cm. longa 1 cm. lata obtusa, basin versus paullo angustata, teres.—British Honduras: Valentin, El Cayo District, on limestone hill in advanced forest, June–July, 1936, *C. L. Lundell 6318* (type in Herb. Field Mus.; duplicate in herb. Univ. Michigan).

"Trunk light tan, fluted." The genus is new for the flora of British Honduras. The species appears to be a clearly distinct one, related to *H. Barcenae* of Oaxaca which has broader, puberulent leaves, rounded at the base.

ARALIACEAE

Oreopanax artocarpoides Standl., sp. nov.—Arbor 6–8-metralis, ramulis crassis apicem versus dense foliatis, internodiis brevibus dense minute stellato-tomentulosis vel glabratis; folia mediocria longe petiolata crasse coriacea, petiolo crassiusculo basi valde dilatato usque 10 cm. longo minute stellato-tomentello vel glabrato; lamina lanceolato-oblonga vel oblongo-ovata 11–20 cm. longa 3–8 cm. lata longe sensim apicem versus attenuata, apice ipso acuto vel obtuso, basi rotundata vel truncata, supra in sicco flavescens lucidissima, glabra vel ad costam minute stellato-tomentella, nervis subimpressis, subtus pallida lutescens densissime minute stellato-tomentella, basi 5-nervia, costa crassa elevata, nervis lateralibus utroque latere circiter 10 angulo semirecto vel paullo latiore adscendentibus valde irregularibus prope marginem irregulariter arcuato-conjunctis, venis prominulis laxe reticulatis; pedunculi axillares monocephali crassi 5–6 cm. longi minute stellato-tomentelli vel glabrati; capitula densissime multiflora globoso-ovoidea 3–4 cm. longa 3 cm. lata apice late rotundata, bracteis floribus paullo longioribus apice dense brunneo-tomentosis; fructus glaber 1 cm. longus et ultra apice truncatus.—Bolivia: Sailapata, Department of Cochabamba, 3,600 meters, in wet soil at forest edge, October, 1935, *Martín Cárdenas 3350* (type in Herb. Field Mus.).

OLEACEAE

Forestiera Shrevei Standl., sp. nov.—Frutex 4.5 m. altus ut videtur dense rigide ramosus, ramis crassis fusco-ferrugineis teretibus rimosis lenticellis paucis pallidis elevatis conspersis, novellis dense patenter pilosis; folia parva opposita vel plerumque in ramulis brevibus lateralibus dense congestis breviter petiolata herbacea, petiolo pilosulo vix 2 mm. longo; lamina oblonga vel anguste oblonga, interdum oblanceolato-oblonga, 12–22 mm. longa 4–7 mm. lata, apice obtusa vel rotundata, basi acuta vel breviter acuminata, integra, utrinque dense molliter pilis pallidis patentibus pilosula, costa gracili subtus prominente, nervis lateralibus obsoletis; flores plerumque ad nodos defoliatos fasciculati, pedicellis gracilibus 3–5 mm. longis glabris; ovarium glabrum, stylo gracili fere 2 mm. longo glabro; drupa oblique oblonga 5 mm. longa striata glabra.—Arizona: Above Alamo Ranch, Ajo Mountains, Pima County, 720 meters, March 19, 1933, *Forrest Shreve 6201* (type in Herb. Field Mus.). Sierra Tucson, April 24, 1884, *W. F. Parish 218*.

Probably this is *F. neomexicana* var. *arizonica* Gray, although this is by no means certain. At any rate, this clearly distinct Arizona shrub deserves rank as a species. The narrow, obtuse or rounded, entire, densely pubescent leaves are quite unlike those of *F. neomexicana*, which seems to be remarkably uniform in leaf characters.

CONVOLVULACEAE

Ipomoea Chilopsidis Standl., sp. nov.—Frutex 2–5-metralis omnino glaber pauciramosus, ramis gracilibus pallidis puncticulatis, internodiis brevibus; folia breviter petiolata crasse herbacea, petiolo gracili ca. 1 cm. longo; lamina linearis 6.5–19 cm. longa et ultra 6–8 mm. lata, apicem longum filiformem versus longissime sensim attenuata, basin acutam versus brevius attenuata, integra, in sicco fuscescens, opaca, costa gracili subtus prominente, nervis obscuris; flores magni axillares solitarii, pedunculo crassiusculo 5–15 mm. longo, pedicello 1–2 cm. longo superne fistuloso-incrassato; sepala 1.5 cm. longa coriacea oblongo-ovata vel late ovata, exteriora obtusa vel subacuta, interiora apice rotundata, erecta; corolla alba, fauce purpureo, tubo ca. 6 cm. longo e basi ad apicem subsensim dilatato, fauce fere 2.5 cm. lato, limbo patente ca. 7 cm. lato; antherae lineares 9 mm. longae.—Mexico: Guasaremos, Río Mayo, Chihuahua, on oak and pine rims, August 16, 1936, *Howard Scott Gentry 2391* (type in Herb. Field Mus.).

"Shrub 2–5 meters high, with few irregular branches. Flowers white with purple throat. Singularly of the high and arid rims." An isolated species, remarkable for its combination of erect, shrubby habit and extremely long and narrow leaves.

Jacquemontia luxurians (Moric.) Hallier.—This species has a wide distribution in South America, but, so far as I know, it has not been recorded from North America. The following collection, distributed as *Aniseia martinicensis* (Jacq.) Choisy, to which the plant has little similarity except in leaf form, represents the species: Lancetilla Valley, near Tela, Honduras, *Standley 55766*. The plant is a large, herbaceous vine with small, white flowers in dense cymes.

VERBENACEAE

Clerodendron Matudae Standl., sp. nov.—Ramuli graciles teretes striati pallide olivacei paullo nodosi ad nodos dense fulvo-villosi, alibi sparsissime villosuli vel fere omnino glabri, internodiis plerumque elongatis; folia mediocria breviter petiolata membranacea ad apices ramulorum aggregata, petiolo gracili vix ultra 6 mm. longo

sparse puberulo et pilis paucis longioribus consperso; lamina oblongo-oblanceolata vel anguste lanceolato-oblonga 11–17 cm. longa 3.5–6 cm. lata longe sensim acuminata, basin versus sensim attenuata, basi ipsa acuta, supra in sicco laete olivacea ad costam minute sparse puberula, venulis prominulis, subtus paullo pallidior ad costam gracilem prominentem sparsissime pilosa vel glabra, nervis lateralibus utroque latere circiter 7 gracillimis arcuatis angulo fere recto adscendentibus; flores terminales aggregati, pedicellis longissimis gracilibus ut videtur subrecurvis 4.5–6.5 cm. longis glabris; calyx glaber campanulatus 2 mm. longus subangulatus basi subacutus, remote minute 5-denticulatus, inter dentes subtruncatus; corolla glabra, tubo gracili 1 cm. longo medio 1.5 mm. crasso ore paullo latiore, lobis 5 anguste oblongis apice rotundatis circiter 11 mm. longis et 2–2.5 mm. latis venosis patentibus; filamenta 8 mm. longe exserta, antheris circiter 1.5 mm. longis.—Mexico: Mount Orando, Chiapas, December 16, 1936, *E. Matuda 572* (type in herb. Univ. Michigan; fragment in Herb. Field Mus.).

The only other species native in Mexico, *C. ligustrinum* (Jacq.) R. Br., has little in common with the present plant.

Lippia Gentryi Standl., sp. nov.—Frutex 1–2-metralis ut videtur dense ramosus, ramis teretibus ochraceis densissime pilis brevibus patentibus glanduloso-villosulis et plus minusve breviter hirsutis, internodiis brevibus; folia parva breviter petiolata subcoriacea solemniter rugosa, petiolo crassiusculo 6–8 mm. longo dense glanduloso-villosulo; lamina lanceolato-ovata 2.5–3.5 cm. longa 1–1.5 cm. lata, apicem acutum versus sensim angustata, basi rotundata vel obtusa, in toto margine dense acute serrata, supra densissime glanduloso-villosa tactu aspera, nervis venisque impressis, subtus grisea densissime pilis eglandulosis vel interdum glandulosis paucis intermixtis plus minusve intertextis pilosa, costa gracili prominente, nervis lateralibus utroque latere ca. 10 angulo semirecto adscendentibus subarcuatis; flores spicati, spicis capituliformibus circiter 1.5 cm. longis atque 2 cm. latis axillaribus geminatis, pedunculis gracilibus ca. 1.5 cm. longis glanduloso-villosis et breviter hirsutis, bracteis pallide viridibus fere membranaceis in statu fructifero accrescentibus late ovatis vel rotundato-ovatis acutis vel acuminatis arcte imbricatis numerosissimis dense pilis brevibus glandulosis et longioribus eglandulosis patentibus pilosis; calyx densissime pilis longis albis pilosus; corolla 6–7 mm. longa, tubo gracillimo extus glabro, lobis brevissimis extus dense albido-hirtellis.—Mexico: Agrimincor, Río

Mayo, Sonora, on oak slope, April 6, 1937, *Howard Scott Gentry 3039* (type in Herb. Field Mus.). Sierra Chiribo, Río Mayo, Sonora, oak mesa, *Gentry 1785*. Algodones, Río Mayo, Sonora, oak ridge, *Gentry 2037*.

A relative of the Lower Californian *L. barbata* Brandeg.

LABIATAE

Monarda Bartlettii Standl., sp. nov.—Herba erecta ca. 60 cm. alta, caule monocephalo obtuse quadrangulato puberulo et sparse pilis longis albis laxis patentibus piloso, internodiis plerumque foliis longioribus; folia breviter petiolata membranacea, petiolo 2–7 mm. longo dense longipiloso; lamina oblongo-deltoidea vel deltoideo-lanceolata 5–8 cm. longa 2–4 cm. lata apicem acutum versus longe sensim attenuata, basi late rotundata et subcordata, supra dense impresso-punctata et sparse longipilosa, subtus pallidior, dense punctata, minute puberula atque dense longipilosa, apicem versus integra, aliter remote adpresso-serrata; capitula densissime multiflora, corollis exclusis 3 cm. diam., basi bracteis foliaceis viridibus vel ut videtur roseis floribus fere aequilongis fulcrata, bracteis setaceo-filiformibus calycem aequantibus vel brevioribus; calycis tubus angustus ca. 1 cm. longus 10-nervius sparse glanduloso-punctatus dense pilis mollibus longis et brevibus intermixtis pilosus, fauce dense albo-barbatus, dentibus 2.5–3 mm. longis subpatentibus e basi triangulari spinoso-subulatis glandulosis et sparse pilosis; corolla purpureo-rubra extus ubique pilis longis laxis albidis sparse pilosa, tubo ca. 2.5 cm. longo sursum sensim dilatato fauce 5 mm. lato, labio superiore 1.5 cm. longo erecto, inferiore ca. 1 cm. longo; stamina paullo labio superiore longiora.—Mexico: La Begonia, vicinity of San José, Tamaulipas, 960 meters, July 5, 1930, *H. H. Bartlett 10094* (type in Herb. Field Mus.; duplicate in herb. Univ. Michigan).

Close to *M. Pringlei* Fernald, to which the writer once referred it, but in that the long, weak hairs so plentiful upon *M. Bartlettii* are altogether lacking, the calyx is merely minutely puberulent and only sparsely barbate in the throat, its teeth longer and merely beset with short-stipitate glands.

Monarda Eplingiana Standl., sp. nov.—Herba erecta circiter 60 cm. alta, caule simplici monocephalo gracili obtuse quadrangulato fere glabro sed ad nodos dense breviter pilosulo, internodiis foliis duplo longioribus; folia petiolata membranacea, petiolo gracili 5–8 mm. longo puberulo vel glabrato; lamina oblongo-lanceolata vel oblongo-ovata 2.5–4.5 cm. longa 1–2.5 cm. lata, apicem acutum versus longe sensim attenuata, basi rotundata, minute remote adpresso-serrata, apicem versus integra, supra in sicco laete viridis dense minute punctata sparse puberula vel glabrata, subtus paullo pallidior dense punctata tantum ad costam cinereo-puberula, aliter glabra; capitula dense pauciflora, corollis neglectis vix ultra 1 cm. lata, bracteis paucis foliaceis lanceolatis viridibus plus minusve rubro tinctis calycibus interdum duplo longioribus fulcrata, floribus arcte sessilibus, bracteis paucis setiformibus calyce brevioribus; calycis tubus cylindraceus 8 mm. longus prominente nervosus sparse glanduloso-punctatus, sparse vel densius breviter pilosus, fauce densissime longibarbato, dentibus subpatentibus e basi triangulari subulato-acuminatis vix 1.5 mm. longis; corolla ut videtur fere coccinea (an purpureo-rubra?) sparse laxe longivillosa, tubo fere 2.5 cm. longo sursum sensim dilatato fauce 4 mm. lato, labio superiore erecto ad 12 mm. longo, inferiore ca. 8 mm. longo; stamina labio superiore paullo longiora.—Mexico: Del Carmen Mountains, Coahuila, in 1936, *Ernest G. Marsh, Jr. 604* (type in Herb. Field Mus.). Also *No. 818* from the same locality, collected in September, 1936.

This also is related to *M. Pringlei* of Nuevo León, but differs in its shorter calyces with much shorter teeth, also in the somewhat different indument of the leaves. The species is dedicated to Dr. Carl Epling, monographer of the American Labiatae.

SCROPHULARIACEAE

Pentstemon Gentryi Standl., sp. nov.—Herba elata, ut videtur 60 cm. alta vel ultra superne laxe ramosa, caulibus teretibus pallide brunnescentibus laevibus glabris, internodiis brevibus; folia sessilia lanceolato-linearia 5–12 cm. longa 2–7 mm. lata apicem versus longissime anguste attenuata, basin versus quoque paullo attenuata, in 2 tertiis superioribus acute adpresso-serrata, versus basin integra, herbacea glabra, nervis lateralibus obsoletis; rami floriferi numerosi elongati, anguste thyrsoideo-paniculiformes ca. 15 cm. longi laxe multiflori, pedunculis 1–3-floris, bracteis foliis similibus sed multo brevioribus saepe integris, pedicellis curvis 1 cm. longis vel brevioribus sparse villosulis vel glabris; sepala 1 cm. longa lineari-lanceolata subabrupte longe anguste attenuato-acuminata sparse villosula vel fere glabra; corolla 3 cm. longa extus glabra, prope basin in tubum 5 mm. longum crassum contracta, supra tubum abrupte expansa, fauce 1.5 cm. lata, lobis lavandulaceis ca. 6 mm. longis apice rotundatis intus glabris, tubo albo; staminodium glabrum; filamenta glabra, antherae loculis divaricatis fere 2 mm. longis toto longitudine dehiscentibus glabris; capsula immatura glabra ovoideo-globosa 8 mm. longa apice rotundata et subito in stylum ca. 17 mm. longum contracta.—Mexico: Canelas, Río Mayo, Chihuahua, in forest on mesas and in arroyos, October 2, 1935, *Howard Scott Gentry 1910* (type in Herb. Field Mus.).

Among Mexican species of *Pentstemon* with large, broad corollas the plant is conspicuous on account of its long and extremely narrow leaves.

GESNERIACEAE

Columnea venusta Standl., sp. nov.—Frutex epiphyticus, ramis crassis subteretibus longitrorsum rugosis rubro-ferrugineis, internodiis brevibus pilis plurilocularibus purpurascentibus sat dense villosis; folia mediocria brevissime petiolata in sicco coriacea, foliis paris valde inaequalibus, petiolo crasso vix ad 3 mm. longo purpureo-villoso; lamina oblonga vel lanceolato-oblonga, laminis majoribus circiter 7.5 cm. longis atque 2 cm. latis, apice acuminata vel longi-acuminata, basi valde inaequilateralis, latere interiore semiobtusa vel semirotundata, altero auriculata et cordata, auricula rotundata, supra in sicco griseo-viridis dense minute puncticulata glabra, costa subimpressa, nervis obsoletis, subtus sparse albido-strigosa, ad costam nervosque dense purpureo-villosa, costa crassiuscula prominente, nervis lateralibus utroque latere 4–5 angulo acuto adscendentibus remotis leviter arcuatis in marginem supra medium desinentibus, venis obsoletis; flores ad axillas solitarii, pedunculo gracili apice recurvo 4–5 cm. longo dense pilis longis purpureis patentibus vel adscendentibus villoso; calyx basi obliquus fere aequaliter partitus extus subdense purpureo-villosus intus glaber, lobis fere 2 cm. longis ovatis basi rotundatis vel subcordatis profunde laciniato-lobatis, lobis utroque latere circiter 5 angustis, terminali fere integro sensim acuminato; corolla rubra 7.5 cm. longa extus subsparse pilis longis laxis villosa, tubo leviter incurvo fauce 12 mm. lato, lobis 2 inferioribus oblongo-ovatis 2 cm. longis, postico usque 3.5 cm. longo trilobo apice late rotundato et brevissime emarginato; antherae 3 mm. longae; stylus circiter 7 cm. longus sparse villosulus.—Guatemala: Along trail, Finca Volcán to Cerro Sillab, Senahú, Alta Verapaz, July 27, 1936, *W. R. Hatch & C. L. Wilson 154* (type in Herb. Field Mus.).

In a genus noted for its many handsome species, this must be an unusually showy plant because of the exceptionally large corollas.

Solenophora Wilsonii Standl., sp. nov.—Herba erecta vel frutex humilis, ramulis subteretibus gracilibus pilis brevissimis crassis fere papilliformibus dense indutis, internodiis brevibus vel paullo elongatis; folia opposita longipetiolata membranacea, petiolo 1.5–4 cm. longo gracili dense vel sparse papillloso-villoso; lamina forma variabilis, elliptica, late ovato-elliptica, oblongo-elliptica vel interdum obovato-elliptica 9–15 cm. longa 4.5–8 cm. lata breviter acuminata vel interdum tantum acuta, basi plus minusve inaequali acuta vel rare subrotundata et subito contracto-decurrens, in fere toto margine grosse vel adpresse serrata, supra in sicco viridis sparsissime breviter villosa, subtus paullo pallidior ad nervos venasque pilulis crassis papilliformibus subdense conspersa, costa gracili, nervis lateralibus utroque latere circiter 10 angulo lato adscendentibus arcuatis, venulis prominulis laxe reticulatis; flores axillares solitarii, pedunculo 7–10 mm. longo, hypanthio obovoideo 3–4 mm. longo ut petiolo dense papilloso-villosulo; calyx campanulatus viridis vel atropurpureus 1.5 cm. longus fere 1 cm. latus sparse breviter villosulus, lobis brevibus inaequalibus subrotundatis grosse dentatis; corolla ut videtur alba extus sparse pilis longis albidis villosa, tubo 3 cm. longo superne sensim dilatato, ore 1–1.5 cm. lato, lobis subaequalibus late rotundatis intus glabris, marginibus dense fimbriato-dentatis, dentibus angustis attenuatis glanduloso-puberulis.—Guatemala: Chacirociha, Finca Seamay, Senahú, Alta Verapaz, August 1, 1936, *W. R. Hatch & C. L. Wilson 201* (type in Herb. Field Mus.). Also another specimen from the same locality, with the same number, collected July 30.

RUBIACEAE

Amaioua contracta Standl., sp. nov.—Arbuscula 5.5 m. alta, ramulis crassis breviter dense hispidis, internodiis brevissimis; stipulae tenues basi circumscissae ferrugineae fere 2 cm. longae acutiusculae extus dense adpresso-hispidae intus glabrae; folia mediocria brevissime petiolata subcoriacea, petiolo crasso vix ad 5 mm. longo piloso; lamina lanceolato-oblonga vel oblongo-ovata 14–17 cm. longa 5–7 cm. lata abrupte caudato-acuminata versus basin abrupte contracta et fere ad basin petioli acuminato-decurrens, supra in sicco sublucida brunnescens ad costam nervosque adpresso-hispida aliter glabra vel in statu juvenili ut videtur sparse hispida, costa nervisque vix prominulis, subtus paullo pallidior, undique, ad costam nervosque densius, adpresso-hispida, costa gracili elevata, nervis lateralibus utroque latere circiter 15 elevatis angulo latiusculo adscendentibus leviter arcuatis in marginem desinentibus, nervulis prominulis arctissime reticulatis; flores masculi ad apicem ramuli capitati numerosissimi arcte sessiles; calyx extus densissime pilis ochraceis adpresso-hirsutus 3 mm. longus campanulatus, dentibus remotis linearibus erectis 1.5 mm. longis; corolla in alabastro 8 mm. longa extus densissime subadpresso-pilosa, lobis oblongis acutiusculis tubo paullo longioribus.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, between Rio Livramento and Rio Ipixuna, November, 1934, *B. A. Krukoff 7230* (Herb. N. Y. Bot. Gard., type; photo. and fragment in Herb. Field Mus.).

Well marked by the form of the leaves, which are practically sessile, being abruptly contracted toward the base and long-decurrent almost to the base of the petiole.

Cephaelis madeirana Standl., sp. nov.—Arbuscula 6-metralis praeter inflorescentiam omnino glabra, ramulis sat gracilibus pallide olivaceis subteretibus, internodiis elongatis; stipulae persistentes virides in tubum truncatum 2–3 mm. longum coalitae, tubo lobis 4 linearibus erectis 3–3.5 mm. longis paullo infra marginem insertis onusto; folia mediocria brevissime petiolata submembranacea, petiolo 2 mm. tantum longo; lamina elliptico-oblonga vel elliptico-ovata 9–15 cm. longa 4–6.5 cm. lata, anguste sensimque vel subabrupte breviusque acuminata, basi obtusa vel subrotundata, supra in sicco opaca cinereo-olivacea, costa nervisque prominulis, subtus paullo pallidior, costa gracili elevata, nervis lateralibus utroque latere circiter 9 gracillimis pallidis prominentibus arcuatis angulo latiusculo adscendentibus, nervulis prominulis laxe reticulatis; inflorescentia terminalis capituliformis crasse 4 mm. longe pedunculata, dense pauciflora, circiter 3 cm. lata, bracteis ut videtur viridibus foliaceis oblongis vel anguste ellipticis 1.5–2.3 mm. longis acutis subpatentibus basi paullo puberulis, floribus paucis arcte sessilibus; hypanthium 1.5 mm. longum glabrum, calyce 3 mm. longo tubuloso-campanulato brevissime acute dentato glabro; corolla glabra ca. 13 mm. longa, tubo gracili, lobis ovatis brevibus; antherae exsertae.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, near Tres Casas, on varzea land, September–October, 1934, *B. A. Krukoff 6189* (Herb. N. Y. Bot. Gard., type; photo. in Herb. Field Mus.).

Coussarea Krukovii Standl., sp. nov.—Frutex 5.5 m. altus, trunco 3.5 cm. diam., ramis crassis olivaceis striatis glabris; stipulae (imperfectae tantum visae) 2.5 cm. longae et ultra; folia inter maxima petiolata crasse chartacea vel subcoriacea in sicco fusco-olivacea glabra, petiolo crasso 4–4.5 cm. longo; lamina cuneatim oblongo-obovata circiter 30 cm. longa atque 13 cm. lata, apice obtusa vel subrotundata et abrupte in acumen anguste triangulare 1.5 cm.

longum contracta, basin versus longe sensim cuneato-attenuata, basi ipsa acuminata, supra opaca, costa prominula, nervis lateralibus manifestis sed non elevatis, subtus fere concolor, costa elevata, nervis lateralibus utroque latere circiter 8 angulo latiusculo adscendentibus arcuatis prope marginem arcuato-conjunctis; inflorescentia terminalis 2.5 cm. longe pedunculata ut videtur capitata vel breviter spicata dense multiflora, axi 1.5 cm. longa, floribus congestis sessilibus; sepala in statu fructifero 4–5 mm. longa late triangularia obtusa vel acutiuscula striata ad apicem drupae persistentia; fructus ovalicolumnaris densiuscule breviter pubescens fere 2 cm. longus 10–13 mm. latus grosse obtuse longitrorsum costatus.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, varzea land, September–October, 1936, *B. A. Krukoff 8132* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

The very large, oblong-obovate leaves and unusually large and conspicuously costate drupes are outstanding characters.

Genipa vulcanicola Standl., sp. nov.—Arbor 15-metralis, trunco fere 30 cm. diam., ramulis crassis ochraceis glabris, internodiis brevissimis; stipulae deciduae virides oblongo-ovatae obtusae extus prope basin sparse breviter hirsutae; folia petiolata chartacea, petiolo crassiusculo 1–2 cm. longo secus margines breviter hirtello vel glabrato; lamina elliptica vel oblongo-elliptica 11–12 cm. longa 4.5–6 cm. lata acuta vel obtusa, basi acuminata, glabra, supra in sicco griseo-viridis, nervis manifestis sed vix elevatis, subtus fere concolor, in axillis nervorum solemniter domatiata, costa gracili elevata, nervis lateralibus utroque latere circiter 7 angulo fere semirecto adscendentibus subarcuatis pallidis prominulis teneris prope marginem irregulariter arcuato-conjunctis, venulis manifestis sed vix elevatis laxe reticulatis; inflorescentia terminalis cymoso-corymbosa sessilis basi trichotoma circiter 4 cm. longa et aequilata vel latior, pauciflora, ramis crassis sparse hirtellis, bracteis parvis vel minutis, floribus in cymas trifloras dispositis, pedicellis florum lateralium crassis ad 1 cm. longis; calyx late campanulatus 1 cm. longus et aequilatus extus intusque glaber, truncatus et remote breviter dentatus, dentibus latissime triangularibus vix ultra 1 mm. longis; corolla alba subcoriacea extus glabra in alabastro late obtusa, tubo 1 cm. longo superne 4 mm. crasso versus basin sensim angustato, lobis patentibus rotundato-obovatis apice late rotundatis sparse ciliatis intus glabris; antherae semiexsertae.—Guatemala: In forest, Volcán Atitlán, 2,310 meters, October 24, 1934, *Alexander F. Skutch 1512* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

A very distinct species, somewhat similar to *G. americana* L., which has acuminate stipules, leaves with more numerous nerves, and the calyx sericeous within, besides differing in various other characters.

Hippotis mollis Standl., sp. nov.—Ramuli crassi dense breviter fulvo-hirsuti, internodiis brevibus; stipulae non visae; folia magna breviter petiolata crasse papyracea, petiolo crasso ca. 2 cm. longo dense breviter hirsuto; lamina late obovato-elliptica 15–19 cm. longa 8–10 cm. lata apice abrupte breviter acuminata, acumine ipso anguste triangulari acuto, basi acuta vel subobtusa, supra in sicco fusca sublucida ubique subdense breviter setoso-hirsuta, tactu asperula, nervis manifestis sed non elevatis, subtus pallidior, dense pilis brevibus fulvis patentibus setoso-hirsuta, costa gracili elevata, nervis lateralibus utroque latere ca. 10 angulo acuto adscendentibus versus apicem arcuatis gracilibus prominentibus prope marginem arcuato-conjunctis, venulis transversis parallelis crebris prominentibus, areolis arcte lineolatis; inflorescentiae axillares ca. 8 mm. longe pedunculatae triflorae, floribus breviter pedicellatis; hypanthium anguste turbinatum 5 mm. longum dense fulvo-hirsutum; calyx 3 cm. longus medio 7 mm. latus acuminatus uno latere ad medium fissus densissime fulvo-hirsutus; corolla ca. 4.5 cm. longa decurva, tubo sursum sensim ampliato fauce 1 cm. lato extus dense strigoso-sericeo, lobis erectis latissimis vix ultra 5 mm. longis apice subtruncatis et breviter emarginatis.—Colombia: State of Boyacá, *A. E. Lawrance 505* (type in Herb. Field Mus.).

Related to the other Colombian species, *H. albiflora* Karst., which lacks the dense, velvety tomentum of the lower leaf surface that is so prominent in the present species.

Hoffmannia riparia Standl., sp. nov.—Frutex ramosus 3-metralis, ramis crassis obtuse tetragonis glabris, internodiis brevibus; stipulae breves acutae, perfectae non visae; folia opposita magna membranacea breviter petiolata, petiolo crasso 1–2 cm. longo glabro; lamina oblongo-obovata vel obovata circiter 26 cm. longa et 8–8.5 cm. lata acuta vel breviter acuminata vel abrupte breviacuminata, basin versus e medio longe sensim attenuata et ad petiolum longe decurrens, glabra, supra in sicco viridis, costa venisque non elevatis, subtus pallidior, costa crassa prominente, nervis lateralibus utroque latere ca. 20 gracilibus angulo semirecto adscendentibus fere rectis prope marginem conjunctis, venulis paucis laxe reticulatis; flores cymosi, cymis axillaribus et ex nodis defoliatis nascentibus laxe multifloris 5 cm. longis fasciculatis sessilibus glabris, floribus plerumque secundis, pedicellis gracilibus ad 6 mm. longis; sepala ad apicem baccae persistentia late triangularia acutiuscula vix 1 mm. longa; baccae pallide purpureae ovales vel subglobosae usque ad 8 mm. longae glabrae.—Guatemala: Colomba, Dept. Quezaltenango, beside stream in forest, 720 meters, September 24, 1934, *Alexander F. Skutch 1291* (herb. Arnold Arb., type; photo. in Herb. Field Mus.).

Although possessing no outstanding characters to mark it, this plant does not agree with any of the *Hoffmannia* species known to the writer.

Macrocnemum vestitum Standl., sp. nov. Ramuli graciles subcompressi brunnei dense molliter pilis longiusculis pilosi, internodiis elongatis; stipulae ovales 13 mm. longae apice late rotundatae prope basin pilosae sursum glabratae; folia mediocria petiolata membranacea, petiolo gracili piloso 1–2.5 cm. longo; lamina late obovata vel fere rotundato-obovata 6–11.5 cm. longa 3.5–6.5 cm. lata apice rotundata et breviter triangulari-apiculata, basi cuneatim angustata et acuta vel late obtusa, in statu sicco fusca, supra primo graciliter pilosa serius glabrata, subtus undique ad nervos densius pilis longis pallidis mollibus pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 9 angulo lato divergentibus tenerrimis fere rectis, venulis fere obsoletis; inflorescentia axillaris ad 5.5 cm. longe pedunculata cymoso-paniculata sublaxe multiflora ca. 4.5 cm. longa e basi trichotoma, ramis densiuscule pilis brevibus subadpressis pilosis, bracteis interdum foliaceis oblongis vel lanceolatis ad 1 cm. longis, floribus mediocriter pedicellatis, pedicellis rigidis basi lanceolato-bracteolatis; hypanthium anguste clavatum 4–5 mm. longum basi acutum sparse subadpresse hispidulum; calyx fere ad basin partitus, segmentis post anthesin accrescentibus ut videtur coloratis valde inaequalibus anguste lanceolato-oblongis usque ad 8 mm. longis, versus apicem obtusum vel subacutum paullo attenuatis; corollae tubus 6–8 mm. longus crassiusculus extus paullo hispidulus vel fere glaber, lobis rotundato-ovatis ca. 5 mm. longis apice rotundatis extus glabris; stylus glaber 4–5 mm. longus; capsula juvenis anguste oblongo-clavata sparse hispidula 1 cm. longa calyce persistente coronata.—Ecuador: Pumacocha, 1857–59, *R. Spruce 6027* (type in Herb. Mus. Vienna).

Macrocnemum cuencanum Standl., the only other species reported for Ecuador, is an almost glabrous plant. *M. vestitum* is noteworthy for its abundant pubescence, and especially for the large and accrescent calyx lobes.

Manettia cephalophora Standl., sp. nov.—Volubilis, ramis herbaceis subteretibus glabris, internodiis elongatis; stipulae glabrae in vaginam latam 2–2.5 mm. longam coalitae, lobis liberis subulatis incrassatis usque ad 5 mm. longis; folia mediocria opposita breviter petiolata crasse chartacea, petiolo crassiusculo glabro 3–4 mm. longo; lamina elliptica vel oblongo-elliptica ca. 6.5 cm. longa atque 2.5 cm. lata longe anguste acuminata, basi acuta, glabra, supra in sicco fusco-olivacea, costa impressa, nervis obscuris, subtus fusco-brunnescens, costa prominente, nervis lateralibus utroque latere ca. 4 tenerrimis obscuris angulo acutissimo adscendentibus, nervulis obsoletis; inflorescentiae terminales et axillares capitatae densissime multiflorae 1–1.5 cm. latae pedunculatae, floribus sessilibus; hypanthium glabrum; calycis laciniae 4 alte connatae in statu fructifero recurvae late oblongae vel ovales apice rotundatae vel obtusissimae crassae ca. 3 mm. longae virides; capsula teres cylindrica 1 cm. longa fere 4 mm. crassa glabra longitrorsum striata, seminibus late alatis.—Brazil: Bahia, *Blanchet 1140* (Herb. Delessert, type).

In his monograph of the genus *Manettia* Wernham described two species, *M. capitata* and *M. Miersiana*, both Brazilian, with capitate inflorescence. Both were based upon specimens in flower. I have seen no material of either species, but have no doubt that the plant here described is closely related to them, although differing in its relatively broad calyx lobes. The capsule of *M. cephalophora* is so unlike that of other species of *Manettia* that the reference of the plant to this genus is decidedly questionable. If the fruit of *M. capitata* and *M. Miersiana* should prove to be like that of *M. cephalophora*, it is probable that these species will have to be segregated as a distinct genus.

Palicourea affinis Standl., sp. nov.—Arbuscula 5.5 m. alta, ramulis crassis teretibus minute sparse puberulis vel fere glabris, internodiis elongatis; stipulae persistentes erectae basi breviter connatae, laciniis utroque latere 2 anguste oblongo-lanceolatis attenuatis 1 cm. longis suberectis glabris; folia mediocria breviter petiolata opposita subcoriacea, petiolo crasso 4–7 mm. longo; lamina oblongo-elliptica 13–18 cm. longa 6.5–9 cm. lata, apice subabrupte acuta vel acutiuscula, basi obtusa vel rotundata, supra in sicco lucida lutescenti-olivacea, costa elevata, nervis prominulis, glabra, subtus paullo pallidior, ad costam nervosque hispidula, aliter glabra vel glabrata, costa crassa elevata, nervis lateralibus utroque latere ca. 11 prominentibus valde arcuatis, nervulis obscuris transversis non reticulatis; inflorescentia terminalis 8.5 cm. longe pedunculata corymbiformis dense multiflora ca. 7 cm. alta et 9 cm. lata, fastigiato-ramosa, ramis dense hispidulis valde adscendentibus basi bracteis linearibus vel subulatis ad 8 mm. longis fulcratis pedicellis erectis 3–5 mm. longis dense hispidulis; calyx late campanulatus 2 mm. longus puberulus vel glabratus persistens; fructus 4–5 mm. longus ovoideus apice constrictus glabratus valde costatus. —Brazil: State of Amazonas, basin of Rio Madeira, Humayta, on plateau between Rio Livramento and Rio Ipixuna, on campinarana, November, 1934, *B. A. Krukoff 7280* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

A relative of **Palicourea verrucosa** (Muell. Arg.) Standl., comb. nov. (*Psychotria verrucosa* Muell. Arg.).

Pentagonia grandiflora Standl., sp. nov.—Folia (perfecta non visa) maxima crasse papyracea glabra integra, petiolo non viso, lamina 125 cm. longa et 100 cm. lata, nervis lateralibus subtus valde elevatis, costa crassissima valde elevata; flores dense aggregati sessiles rubri, bracteis late ovatis vel oblongo-ovatis ca. 6 cm. longis, dorso minute sparse sericeis vel glabratis; calyx tubulosus 5.5–6 cm. longus extus minute sparse sericeus, superne sensim dilatatus, lobis suberectis oblongo-ovatis 1.5 2 cm. longis obtusis; corolla 6 cm. longa extus sparse minute sericea vel fere glabra, tubo 5 mm. lato superne vix dilatato, lobis oblongo-triangularibus 5 mm. longis acutiusculis intus ad marginem apicemque papilloso-villosulis.— Ecuador: Río Cojumíes (?), above tidewater, in 1921, *W. W. Rowlee & George Mixter 1271* (U. S. Nat. Herb., type).

The type consists of two sheets, one with well preserved flowers and inflorescences, the other with a badly dried and badly mounted leaf, or rather a part of the leaf, with the petiole missing. Although little is known regarding the leaf characters, which are of importance in separating the species of *Pentagonia*, the flowers are almost twice as large as those of any member of the genus previously described.

Plocaniophyllon flavum Brandeg. Univ. Calif. Publ. Bot. 6: 69. 1914.

The genus consists of a single species, based upon a plant collected in the State of Chiapas, Mexico, by Dr. C. A. Purpus. A second collection is now available: Mount Orando, Chiapas, December, 1936, *E. Matuda 418* (herb. Univ. Michigan). In the *North American Flora* (32: 139. 1921) the writer placed the genus in the tribe Mussaendeae, chiefly upon the basis of the curious striolate nervation (*Moireestreifung*) of the leaves, a character known otherwise only

in that tribe, in such genera as *Sommera* and *Pentagonia*. At that time mature fruit was not available for study. The Matuda collection bears ripe capsules, which make it impossible to refer the plant to the Mussaendeae, in which the fruit is fleshy. Apparently *Plocaniophyllon* must be placed in the tribe Condamineeae, where it does not appear to be closely related to any other group, and is at once recognizable by the leaf striolation.

Pogonopus speciosus (Jacq.) Schum.—This handsome shrub or small tree, noteworthy for having some of its calyx lobes greatly enlarged, foliaceous, and brilliant red in color, has a wide range in tropical America, but is not common in most parts of Central America. It has been collected recently as far north as Mexico: Escuintla, Chiapas, December, 1936, *E. Matuda 560* (herb. Univ. Michigan).

Psychotria Krukovii Standl., sp. nov.—Frutex 2.5 m. altus, ramulis subteretibus ferrugineis densissime pilis patentibus ferrugineis hirsutis, internodiis brevibus vel elongatis; stipulae cito deciduae ferrugineae ca. 12 mm. longae oblongo-ovatae acuminatae extus dense ferrugineo-pilosae; folia breviter petiolata mediocria vel magna papyracea, petiolo crasso 4–10 mm. longo dense hirsuto; lamina anguste oblonga vel lanceolato-oblonga prope medium latissima 12–21 cm. longa 3.5–6.5 cm. lata et ultra, sensim longiacuminata, basi acuta vel anguste obtusa, supra in sicco cinerascens ad costam breviter hispidula aliter glabra, costa nervisque subimpressis, subtus undique ad venas densius breviter pilis ferrugineis hirsuta, costa gracili elevata, nervis lateralibus utroque latere ca. 15 gracilibus elevatis adscendentibus arcuatis, nervulis prominulis laxe reticulatis; inflorescentiae terminales atque pseudolaterales 1.5–2.5 cm. longe pedunculatae cymoso-paniculatae densissimae 2–2.5 cm. longae basi trichotomae, ramis brevibus densissime ferrugineo-pilosis, floribus sessilibus dense aggregatis, bracteis parvis angustis pilosis; hypanthium dense ferrugineo-pilosulum, calycis dentibus brevibus obtusis; corolla extus glabra vix ultra 2 mm. longa, lobis latis patentibus tubo subaequilongis intus glabris; stamina exserta, antheris oblongis 0.8 mm. longis.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, near Tres Casas, on low terra firma, September–October, 1934, *B. A. Krukoff 6172* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.); also *No. 6509* from the same region.

Noteworthy in the subgenus *Mapouria* for the very narrow, short-petiolate leaves and the abundant, rusty pubescence.

Psychotria paulina Standl., sp. nov.—Herba(?) vel frutex omnino glaber, ramis ut videtur crassis; stipulae fere ad basin bilobae, segmentis 1 cm. longis vel ultra acuminatis semiovatis striatis; folia inter maxima petiolata firme membranacea, petiolo crasso fusco fere 4 cm. longo; lamina late obovato-elliptica 27–33 cm. longa 14–15 cm. lata apice late rotundata et brevissime apiculato-acuminata, basi cuneato-acuta, supra in sicco fusca, nervis pallidis prominulis, subtus pallidior, viridis, costa gracili prominente, nervis lateralibus utroque latere circiter 21 angulo recto divergentibus valde arcuatis teneris marginem attingentibus, inter venulas minute verruculosa, venulis inconspicuis vix prominulis laxe reticulatis; inflorescentia terminalis capituliformis graciliter 13 cm. longe pedunculata, dense multiflora 3 cm. longa 4 cm. lata, bracteis exterioribus ut videtur rubris lanceolato-ovatis longiacuminatis fere 2 cm. longis, interioribus brevioribus latis, floribus sessilibus vel brevissime pedicellatis; calyx ad apicem fructus persistens 1.5 mm. longus irregulariter breviter lobatus, lobis obtusis vel subacutis; fructus didymo-ovoideus 5 mm. longus et fere aequilatus, pyrenis 2 facie commisurali leviter anguste canaliculatis dorso obtuse 5-costatis. Brazil: State of Amazonas, São Paulo de Olivença, on terra firma, July, 1936, *B. A. Krukoff 7839* (type in herb. N. Y. Bot. Gard.).

Randia mollifolia Standl., sp. nov.—Ut videtur inermis, ramulis teretibus in sicco striatis ochraceis densiuscule griseo-hirtellis, internodiis superioribus brevibus; stipulae deciduae e basi late triangulari anguste acuminatae 7 mm. longae extus prope basin sparse hirtella, interdum ad 2 cm. longae; folia inter maxima petiolata firme membranacea, petiolo gracili 2–3.5 cm. longo dense hirtello; lamina forma variabilis, late ovata, ovato-elliptica vel latissime elliptica, 13–23 cm. longa 7.5–14.5 cm. lata, acuta vel subacuminata, basi obtusa vel rotundata et subito contracto-decurrens, supra in sicco griseo-fusco-viridis, densissime glanduloso-puberula et dense breviter molliter pilosa, nervis manifestis, subtus densissime cano-tomentosa, nervis lateralibus utroque latere ca. 12 angulo latiusculo adscendentibus arcuatis; fructus crasse 5 cm. longe pedunculatus ovali-globosus 4.5 cm. longus 3.5 cm. latus apice crasse apiculatus glaber.—Mexico: Saguaribo, Río Mayo, Sonora, on talus slope at cliff base in high, dark canyon, 1,650 meters, November 3, 1935, *Howard Scott Gentry 2139* (type in Herb. Field Mus.).

Vernacular name Sapuchi de la sierra. Similar in general characters to *R. Watsoni* Robinson, in which the branches are armed with spines, and the leaves much smaller and short-petiolate.

Retiniphyllum cearense Standl., sp. nov.—Ramuli subteretes densissime hispiduli ad nodos plus minusve resinosi, internodiis 1–3 cm. longis; stipulae in vaginam brevem subtruncatam dense hispidulam connatae; folia parva breviter petiolata coriacea, petiolo 2–3 mm. longo crasso; lamina oblongo-elliptica vel interdum oblongo-obovata 3–4.5 cm. longa 1.5–2.5 cm. lata obtusa vel acutiuscula, basi obtusa, supra sublucida ad costam hispidula, secus margines scaberula, nervis obsoletis, subtus dense scaberulo-hispidula, pilis subpatentibus albidis, costa crassa elevata, nervis lateralibus utroque latere ca. 6 obscuris; flores terminales subcapitati pauci sessiles, involucello parvo disciformi subintegro; hypanthium obovoideum 3 mm. longum scaberulum; calyx campanulatus 5–6 mm. longus ore 4 mm. latus hispidulus brevissime obtuse dentatus; corolla extus sericea, tubo cylindraceo 23 mm. longo 2.5 mm. lato, lobis oblongis 8–10 mm. longis patentibus vel reflexis obtusis intus sericeis; stamina in apice tubi inserta lobis corollae duplo breviora, filamentis crassiusculis adpresso-pilosis.—Brazil: Province de Ceará, in 1838, *Gardner 156* (Herb. Delessert, type).

The genus *Retiniphyllum* is a small and well marked one, isolated within the family, its previously known species occurring in Amazonia, Venezuela, and British Guiana. The species here described represents a considerable extension from the previously known range of the group. It is related to *R. erythranthum* Standl., of Mount Duida, Venezuela, in which the leaves have only a sparse pubescence of closely appressed hairs.

Rudgea Garciana Standl., sp. nov.—Ramuli crassiusculi ochracei plus minusve striati et rimosi, internodiis elongatis glabris; stipulae in vaginam brevem latam conjunctae induratae apice late rotundatae vix ultra 2.5 mm. longae dorso paullo infra apicem setis numerosis rigidis pallidis 3.5 mm. longis onustae; folia mediocria glabra breviter petiolata crasse coriacea, petiolo crasso 7–10 mm. longo; lamina oblonga vel oblanceolato-oblonga ca. 11 cm. longa et 3.5–4 cm. lata subacuta, apice ipso obtuso, basi acuta, supra in sicco fusca, costa impressa, nervis manifestis sed vix elevatis, subtus multo pallidior, costa crassa elevata, nervis lateralibus utroque latere ca. 12 arcuatis angulo semirecto vel latiore adscendentibus prominentibus gracilibus, venulis manifestis sed parum elevatis laxe reticulatis; inflorescentia glabra terminalis cymose circiter 4-flora erecta 2 cm. longe pedunculata, bracteis parvis deciduis, pedicellis crassiusculis ad 1 cm. longis; hypanthium columnari-turbinatum 3 mm. longum; sepala fere libera 5–6 mm. longa lineari-oblonga attenuata; corolla glabra 3.5–4 cm. longa, tubo superne sensim dilatato fauce 5 mm. lato, lobis tubo aequilongis lineari-oblongis apice 1.5–2 mm. longe corniculatis, appendicibus filiformibus.—Peru: "Achapatumam, 1787" (Achapata, Puno?), *Ruiz & Pavón* (type in herb. Madrid).

Labeled by the collectors, "An Posoqueriae species?" In most of its characters the plant is quite unlike any other species of *Rudgea* known from the Peruvian region. It is noteworthy especially for its handsome, coriaceous leaves and very large flowers. The species is dedicated to Dr. Antonio García Varela, Director of the Jardín Botánico of Madrid.

Rudgea Krukovii Standl., sp. nov.—Frutex 4.5 m. altus, ramulis crassis ochraceo-olivaceis obtuse subtetragonis glabris, internodiis elongatis; stipulae persistentes crassae ovato-rotundatae 6–7 mm. longae valde costatae multilaciniatae, setis incrassatis pallidis; folia magna breviter petiolata coriacea, petiolo crasso ca. 12 mm. longo; lamina elliptica vel oblongo-elliptica ca 20 cm. longa et 10 cm. lata, acuminata vel breviter subabrupte acuta, basi acuta vel anguste obtusa, supra in sicco lutescenti-viridis lucida glabra, costa nervisque profunde impressis, subtus pallidior aspera scaberula, costa elevata, nervis lateralibus utroque latere ca. 8 elevatis arcuatis angulo latiusculo adscendentibus juxta marginem conjunctis, nervulis prominentibus laxe reticulatis; inflorescentia terminalis 3 cm. longe pedunculata cymoso-paniculata ca. 4.5 cm. longa et 5.5 cm. lata, ramis crassis breviter pilosis, basalibus 4 patentibus 1–1.5 cm. longis, cymulis paucifloris densis, floribus sessilibus, bracteis lanceolatis calycem aequantibus; calycis laciniae lineari-lanceolatae attenuatae puberulae erectae ca. 1.5 mm. longae; corolla in alabastro obtusa 7 mm. longa papilloso-puberula, lobis patentibus tubo subaequilongis intus minute puberulis, tubo in fauce dense albo-barbato; stamina breviter exserta, filamentis ad faucem insertis glabris, antheris lineari-oblongis 1.8 mm. longis.—Brazil: State of Amazonas, basin of Rio Madeira, Humayta, near Tres Casas, on varzea land, September–October, 1934, *B. A. Krukoff 6173* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

A relative of *Rudgea paniculata* Benth.

Rudgea palmarum Standl., sp. nov.—Frutex 1.5 m. altus omnino glaber, ramis teretibus glabris gracilibus olivaceis, internodiis plerumque elongatis; stipulae parvae 2–3 mm. longae fere ad basin 3–5-fidae, lobis filiformibus pallidis corneis, persistentes;

folia parva brevissime petiolata crasse membranacea, petiolo usque 2 mm. tantum longo; lamina anguste oblongo-lanceolata 7–11 cm. longa 1.5–3 cm. lata longe anguste attenuata, apice ipso obtuso, basin acutam versus sensim attenuata, supra in sicco fusco-olivacea lucida, costa elevata, nervis obscuris vix prominulis, subtus paullo pallidior sublucida, costa gracili prominente, nervis lateralibus utroque latere 8 9 tenerrimis angulo semirecto adscendentibus subarcuatis prope marginem irregulariter laxe arcuato-conjunctis, venulis vix prominulis laxe reticulatis; flores cymoso-paniculati, panicula terminali graciliter 2–3 cm. longe pedunculata circiter 3 cm. lata et aequilonga laxe pauciflora, bracteis minutis vel obsoletis, pedicellis gracillimis plerumque 3–5 mm. longis; hypanthium turbinatum 1.5 mm. longum, calyce campanulato 1.2 mm. longo viridi breviter inaequaliter dentato, dentibus acutiusculis; corolla glabra in alabastro apice rotundata, tubo 7 mm. longo fauce dilatato, lobis ovato-oblongis acutis patentibus 3 mm. longis intus minute puberulis; antherae lineares semiexsertae; fructus subglobosus circiter 13 mm. diam.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, on low land, September–October, 1936, *B. A. Krukoff 8117* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.), *8561*.

Rudgea singularis Standl., sp. nov. Frutex 1.8 m. altus praeter inflorescentiam omnino glaber, ramis gracilibus subteretibus fusco-olivaceis, internodiis elongatis; stipulae magnae virides lanceolato-oblongae 3.5 cm. longae 9 mm. latae parallele venosae apice profunde trifidae, lobis lateralibus brevibus, terminali longe filiformi-attenuato; folia magna petiolata papyracea, petiolo crassiusculo circiter 2 cm. longo; lamina oblongo-elliptica 18–26 cm. longa 6–8 cm. lata longissime anguste attenuato-acuminata, basi acuta et breviter subdecurrens, supra in sicco olivacea opaca vel lucida, costa nervisque prominentibus, subtus concolor, costa gracili elevata, nervis lateralibus utroque latere circiter 12 teneris angulo lato adscendentibus valde arcuatis juxta marginem arcuato-conjunctis, venulis prominentibus laxe reticulatis; inflorescentiae ut videtur axillares (an pseudo-axillares?) circiter 12 cm. longe graciliter pedunculatae laxe cymoso-paniculatae ut videtur pendentes, circiter 5 cm. longae et aequilatae, ramis divaricatis gracilibus in sicco fuscis sparse minute puberulis, bracteis minutis vel obsoletis, pedicellis brevibus crassiusculis; flores in sicco nigri glabri, hypanthio columnari 1 mm. longo, calyce vix ultra 0.5 mm. longo inaequaliter breviter dentato; corolla in alabastro apice brevissime 5-cornuta, tubo gracili 5–6 mm.

longo fauce vix dilatato, lobis brevissimis circiter 0.5 mm. longis late ovatis.—Brazil: State of Amazonas, São Paulo de Olivença, basin of Belem Creek, terra firma, in high forest, October December, 1936, *B. A. Krukoff 8804* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

The material is rather unsatisfactory for study, especially as regards the inflorescence, but the large leaves and peculiar stipules seem to indicate a species unlike any other known from the Amazon Valley.

Tocoyena megistantha Standl., sp. nov.—Arbor humilis; folia maxima brevissime petiolata crasse membranacea, petiolo crasso 1.5 cm. longo glabro; lamina oblanceolato-oblonga ca. 36 cm. longa 13.5 cm. lata, apice non viso, basin versus longe sensim attenuata, basi ipsa acute cuneata, glabra vel supra sparse pallido-hirsuta, in sicco fusca, costa crassiuscula, nervis lateralibus utroque latere ca. 20 angulo fere recto divergentibus arcuatis prope marginem arcuato-junctis; flores ad apicem rami congesti numerosi sessiles; hypanthium glabrum oblongum 7 mm. longum teres; calyx tubuloso-campanulatus 6 mm. longus glaber, lobis usque 8 mm. longis e basi triangulari longe filiformibus suberectis; corolla alba extus sparse minute puberula, tubo angustissimo ca. 28 cm. longo medio 2.5 mm. crasso fauce paullo dilatato, ore 8 mm. lato, lobis 5 lanceolato-linearibus patentibus 5.5–8 cm. longis longe sensim attenuatis 7–9 mm. latis intus minutissime puberulis; antherae semiexsertae. Colombia: Margarita Creek, vicinity of Barranca Bermeja, between Sogamoso and Colorado rivers, Department of Sur de Santander, 100–500 meters, September 11, 1934, *Oscar Haught 1360* (type in Herb. Field Mus.; duplicate in U. S. Nat. Herb.).

The flowers are extraordinary for their exaggerated length, in this respect having few rivals in any group of Rubiaceae.

CUCURBITACEAE

Corallocarpus hypoleucus Standl., sp. nov.—Scandens, caulibus gracilibus ochraceis subangulatis striatis glabris, internodiis elongatis; folia longipetiolata crasse membranacea, petiolo 2–3.5 cm. longo pallido sparse minute hirtello vel glabrato; lamina ambitu rotundata vel deltoideo-rotundata ad medium triloba, basi profunde cordata, sinu lato aperto, 7–13 cm. longa 8–15 cm. lata, lobis latis acuminatis ad anguste rotundatis, terminali integro, lateralibus basi rotundato-auriculatis, supra in sicco viridis glabra laevis, subtus grisea vel albida densissime pilis minutis subadpressis tomentulosa, basi 3-nervia; fructus globoso-ovoideus 6 cm. longus 5 cm. latus, basi late rotundatus, apice obtusus vel rotundatus et stylo persistente umbonatus, glaber, pedunculis axillaribus solitariis simplicibus 1.5 cm. longis crassis.—Mexico: On road near La Sabana, south of Acapulco, Guerrero, 60 meters, August 25, 1935, *L. H. MacDaniels 266* (type in Herb. Field Mus.).

The type of this species was found in a valuable collection of Mexican plants forwarded to Field Museum for determination by Dr. L. H. Bailey.

COMPOSITAE

Vernonia Taylorae Standl., sp. nov.—Herba perennis 30–40 cm. alta vel ultra, caulibus rigidis erectis simplicibus vel pauciramosis striatis interdum purpureo tinctis sat dense breviter griseo-villosulis, internodiis foliis brevioribus; folia subsessilia rigide herbacea, petiolo vix ultra 2 mm. longo; lamina lanceolata vel in foliis inferioribus oblanceolato-oblonga 5–7.5 cm. longa 1.5–2.5 cm. lata acuta vel saepius longiattenuata, basi obtusa, remote dentato-serrata vel interdum subintegra, supra in sicco fusco-viridis aspera scabra et sparse subvillosula, nervis non elevatis, subtus paullo pallidior ubique dense glanduloso-punctata ad nervos venasque pilis parvis stipitatis stellato-tomentosa, in areolis scabra, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 7; capitula pauca (ca. 8) corymbosa, pedunculis rigidis 1.5–3.5 cm. longis suberectis dense puberulis vel brevissime villosulis; involucrum campanulatum 1 cm. longum 1.5 cm. latum basi rotundatum, phyllariis numerosis gradatim imbricatis adpressis in sicco fusco-purpureis lanceolato-oblongis acuminatis glabratis villoso-ciliatis; flores numerosi ut videtur purpurei; achaenia circiter 50 glandulosa et sparse puberula 1.5 mm. longa, setis pappi rigidis 7 mm. longis antrorse scaberulis.—Mexico: Hacienda Pablillo, Galeana, Nuevo León, July 30, 1936, *Mary Taylor 9* (type in Herb. Field Mus.).

BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

VOLUME XVII NUMBER 3

STUDIES OF AMERICAN PLANTS—VIII

BY
PAUL C. STANDLEY
CURATOR OF THE HERBARIUM, DEPARTMENT OF BOTANY

B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BOTANY
EDITOR

PUBLICATION 395

CHICAGO, U.S.A.
DECEMBER 10, 1937

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

STUDIES OF AMERICAN PLANTS—VIII

PAUL C. STANDLEY

Rosaceae are most numerous among the plants described as new on the following pages. Nearly all of them are from the Amazonian collections made by Mr. B. A. Krukoff, whose whole series of this economically important family was forwarded recently to the writer for study by the New York Botanical Garden.

Conspicuous among the Rubiaceae are several new species of Brazil, discovered during examination of the rich collections of the Museu Goeldi of Pará, sent on loan during the summer of 1937 to Field Museum. These collections, obtained chiefly by Ducke and Huber, illustrate many of the rarer Rubiaceae of Amazonian Brazil, and notes regarding some such species appear upon the following pages.

The other new species described here have been detected mostly in collections from diverse sources, forwarded for determination. There are recorded a number of additions to the ligneous flora of southern Mexico, based upon the collection obtained in early 1937 for Field Museum on the Isthmus of Tehuantepec by Mr. Llewelyn Williams.

COMMELINACEAE

Tradescantia chihuahuensis Standl., sp. nov.—Herba ut videtur erecta vel adscendens gracilis ramosa, caule ubique pilis longis laxis sordidis patentibus vel adscendentibus piloso, internodiis superioribus 2.5–3.5 cm. longis; folia numerosa adscendentia, vagina 1–1.5 cm. longa pallida plus minusve inflata dense longipilosa; lamina anguste oblonga vel lineari-oblonga 8–12.5 cm. longa 2–2.5 cm. lata longe anguste acuminata, foliis inferioribus apice tantum acutiuscula, basi paullo angustata, manifeste multinervia, utrinque sat dense pilis longis laxis patentibus pilosa; flores umbellati, umbellis ex axillis supremis nascentibus vulgo compositis 5–8 cm. longe pedunculatis, bracteis primariis anguste linearibus viridibus 1–2.5 cm. longis vix ultra 1 mm. latis pilosis, umbellulis 6–12 graciliter 1.5–3 cm. longe pedunculatis, pedunculis glabris vel sparsissime pilosis, umbellulis plerumque 3–5-floris, bracteis parvis inconspicuis, pedicellis ca. 1 cm. longis glabris gracillimis; sepala 4 mm. longa ovalia cymbiformia apice obtusa hyalina carinata, carina fere aliformi viridi, densiuscule laxe longipilosa; petala alba vel

caerulescentia venosa ca. 8 mm. longa glabra; capsula subglobosa sessilis 3.5 mm. alta breviter pilosa; semina 6 forma irregularia sed plus minusve globosa ca. 1.2 mm. diam. griseo-nigra grosse tuberculata.—Mexico: Guasaremos, Río Mayo, Chihuahua, shaded canyon bottom, infrequent, August 10, 1936, *Howard Scott Gentry 2365* (type in Herb. Field Mus.).

Closely related to *T. collina* Brandeg., described from San Luis Potosí, but that lacks the abundant pubescence of *T. chihuahuensis*, also the conspicuous bracts subtending the base of the inflorescence. The following recent collections of *T. collina*, from the State of Tamaulipas, are in the Herbarium of Field Museum: Jaumave, sierra near San Lucas, *Von Rozynski 506*. Cerro de Los Armadillos, Sierra de San Carlos, *H. H. Bartlett 10193*.

Tradescantia semisomna Standl., sp. nov.—Herba ut videtur simplex et erecta vel decumbens, e fascicula radicium carnosarum incrassatarum nascens, caule sat dense foliato gracili vel crassiusculo dense pilis brevibus sordidis patentibus pilosulo, internodiis supremis vaginis fere occultis; folia magna, vaginis 1–1.5 cm. longis inflatis densiuscule breviter pilosis vel glabratis cilatis; lamina liguliformis 11–19 cm. longa 2.5–4 cm. lata longiuscule attenuato-acuminata, foliis infimis apice obtusis supra pilis brevibus albidis basi bulbosis versus margines densius pilosula, subtus pilis similibus sed longioribus densius pilosa; flores in vaginis foliorum superiorum dense fasciculati numerosi vix e vaginis exserti, pedicellis gracilibus glabris ad 1 cm. longis; sepala pallida et fere hyalina oblonga obtusa 7–9 mm. longa carinata sparse breviter pilosa vel glabrata, apice puberula.—Mexico: San Bernardo, Río Mayo, Sonora, on cliff, August 31, 1935, *Howard Scott Gentry 1658* (type in Herb. Field Mus.)· Río Bonito, Chihuahua, August 25, 1936, *Harde LeSueur 1085*.

"Flowers pale blue, closed in the afternoon."

LILIACEAE

Anthericum crinitum Standl., sp. nov.—Radices numerosae fasciculatae carnoso-incrassatae; folia omnia radicalia linearia 5.5–7.5 cm. longa medio 6–7 mm. lata utrinque longe anguste attenuata tenuiter multinervia ubique sat dense pilis longiusculis crassiusculis pallidis patentibus hirsuta; scapus simplex rigidus erectus crassiusculus 18–35 cm. altus ut folia hirsutus, prope medium vel superius bractea 1 scariosa 1–1.5 cm. longa adpressa onustus, floribus paucis vel numerosis racemum plus minusve interruptum usque 17 cm. longum efformantibus, pedicellis crassiusculis rigidis vix ad 3 mm.

longis, bracteis parvis ovatis vel lanceolatis scariosis ciliatis; perianthium glabrum luteum, segmentis ca. 12 mm. longis medio trinerviis; filamenta gracillima glabra 4 mm. longa, antheris omnino liberis; capsula sessilis glabra oblonga 1 cm. longa 5 mm. lata viridis subacute trigona, apice emarginata.—Guatemala: Alameda, June 15, 1937, *J. R. Johnston 714* (type in Herb. Field Mus.).

Recognizable at once by the copious pubescence of coarse, rather lax and long, spreading hairs investing the scape and leaves. The plant was growing with another, distributed under the same number, that I take to be *Echeandia parviflora* Baker, a glabrous plant in which the anthers are coherent to form a tube or column.

IRIDACEAE

Sisyrinchium Johnstonii Standl., sp. nov.—Radices fasciculatae numerosae carnoso-incrassatae; fibrae foliorum vetustorum basi plantae persistentes; folia omnia basalia linearia 7.5–8.5 cm. longa 2.5 mm. lata apicem versus longiattenuata laete viridia rigidiuscula multinervia erecta; scapi simplices pauci erecti foliis paullo breviores usque 6 cm. longi ancipites sed vix compressi laeves; spatha 1, valva exterior 3.5–5 cm. longa longiattenuata viridis, interiores ca. 2 cm. longae paullo latiores virides, marginibus interdum pallidis vel purpurascentibus subhyalinis; flores 1–2 subexserti longipedicellati; ovarium oblongum glabrum fere 4 mm. longum; perianthium ut videtur coeruleum (bene evolutum non visum) 4 mm. longum et ultra.—Guatemala: Crater of Volcán de Agua, July 22, 1937, *J. R. Johnston 805* (type in Herb. Field Mus.).

The only other Central American species with simple scapes is *S. tinctorium* HBK., a plant with fibrous roots, and not at all closely related to this one.

AMARYLLIDACEAE

Hymenocallis sonorensis Standl., sp. nov.—Bulbus (perfectus non visus) ca. 7 cm. longus atque 5 cm. latus longicollis; folia basi vaginantia ca. 6 linearia 18–30 cm. longa et ultra medio 10–12 mm. lata apicem obtusum versus longe sensim attenuata, basin versus quoque longiattenuata glabra multinervia, marginibus laevibus; scapus ca. 30 cm. longus gracilis, floribus 4 arcte sessilibus, spathae valvis albidis angustis usque 4.5 cm. longis; ovarium ovoideum attenuatum et subrostratum fere 2 cm. longum; perianthii tubus gracillimus ca. 10 cm. longus parum ultra 1 mm. crassus, laciniis anguste linearibus 6.5–7.5 cm. longis 1.5 mm. latis; corona fere 2 cm. longa; filamenta perianthii segmentis paullo breviora, antheris linearibus 1.5 cm. longis; stylus gracillimus perianthio paullo longior. —Mexico: Alamos, Río Fuerte, Sonora, in valley, July 1, 1936, *Howard Scott Gentry 2267* (type in Herb. Field Mus.).

"Colonial; flowers white. One of the first plants to produce flowers with the summer rains."

PIPERACEAE

Peperomia chicbulana Trelease, sp. nov.—Herba majuscula repenti-pendens, caule 2–3 mm. crasso primum laxe subvilloso; folia alterna lanceolata protracto-acuta, basi acuta, inferiora elliptico-ovata acuminata, basi rotundata, 9–11 cm. longa atque 2.5–4 cm. lata, vel 10 cm. longa atque 6 cm. lata, submultiplinervia, subtus in juventute aliquanto substellato-villosa, in sicco tenuia sed opaca, petiolo 10–20 mm. longo sparse subvilloso; spicae sympodiales 1(ad 3?) scapum brevem bibracteatum terminantes, vix 100 mm. longae atque 2 mm. crassae, pedunculo vix 10 mm. longo sparse piloso; bracteae rotundo-peltatae; baccae ellipsoideo-oblongae granulosae oblique scutellatae, stigmate centrali.—Guatemala: On a tree trunk in high, mesophytic forest of Monte Chicbul, near La Libertad, Dept. Petén, April 29, 1933, *C. L. Lundell 3099* (type in herb. Univ. Michigan).

Peperomia petenensis Trelease, sp. nov.—Herba majuscula glabra, caule 2–3 mm. crasso; folia alterna elliptico-ovata subacuta vel obtusa et emarginata, basi acuta, 7 cm. longa atque 4 cm. lata, 9 cm. longa atque 6 cm. lata, vel 11 cm. longa atque 7.5 cm. lata, e medio inferiore pinnatinervia, in sicco opaca coriacea anguste revoluta, petiolo 1.5–2 cm. longo; spicae 1 vel 2 scapum terminalem ca. 3 cm. longum terminantes, 60–130 mm. longae 2–3 mm. crassae, pedunculo 15–20 mm. longo; bracteae rotundo-peltatae; baccae elliptoideae, rostro gracili, stigmate ad basin rostri anteriore.—Guatemala: In forest on a hill near La Libertad, Dept. Petén, March 28, 1933, *C. L. Lundell 2129* (type in herb. Univ. Michigan).

Piper andresense Trelease, sp, nov.—Frutex, internodiis floriferis gracilibus breviusculis subpersistente crispo-pubescentibus; folia ovata subacuminata, basi cordata vel superiora tantum rotundata, 7–10 cm. longa 4–6.5 cm. lata, 7-nervia vel majora 9-nervia, supra sparse molliter pubescentia, subtus densius pubescentia, petiolo 10–20 mm. longo crispo-pubescente exalato; spicae 40 mm. longae 2 mm. crassae densiflorae, pedunculo 10 mm. longo molliter pubescente; bracteae cucullatae ciliatae.—Guatemala: In the inhabited clearing of San Andrés, Lake Petén, Dept. Petén, May 3, 1933, *C. L. Lundell 3203* (type in herb. Univ. Illinois).

Piper andresense Trelease, var. **subcalvescens** Trelease, var. nov.—Forma glabrescens.—Guatemala: In the inhabited clearing of Yaxha, Dept. Petén, March 23, 1933, *C. L. Lundell 2011* (type in herb. Univ. Illinois).

Piper colaphitolerans Trelease, sp. nov.—Frutex glaber, internodiis superioribus brevibus gracilibus; folia lanceolata 8–9 cm. longa 2.5–3 cm. lata, vel inferiora subelliptica atque 4 cm. lata, anguste acuminata, basi cuneata et solemniter inaequilaterali-unguiculata, 3-nervia, in sicco tenuiter papyracea, petiolo vix 5 mm. longo; spicae 30 mm. longae 2 mm. crassae densiflorae, pedunculo 10 mm. longo; bracteae subcucullatae.—Guatemala: In the *ramonal* at Ixlu, Lake Petén, Dept. Petén, June 15, 1933, *C. L. Lundell 3827* (type in herb. Univ. Illinois).

Piper curvatipes Trelease, sp. nov.—Frutex solemniter nodosus glaber, internodiis granulosis brevibus primo gracilibus; folia lanceolata acuminata, basi angustata obtusa, altero latere breviore, 11 cm. longa 3.5 cm. lata, e medio inferiore pinnatinervia, nervis 4+3, revoluta coriacea, petiolo 5+2 mm. longo; spicae 40 mm. longae 3–4 mm. crassae, pedunculo vix 10 mm. longo curvo; bracteae rotundo-subpeltatae; stigmata 3 sessilia.—Guatemala: On a wet bank at Nictún, Lake Petén, Dept. Petén, May 4, 1933, *C. L. Lundell 3122* (type in herb. Univ. Illinois).

Piper discolor Trelease, sp. nov.—Frutex, internodiis superioribus breviusculis gracilibus praesertim infra nodos plus minusve hirsutis; folia elliptica vel oblanceolata anguste acuminata, basi inaequilaterali subacuta, 16–18 cm. longa 5.5–7.5 cm. lata, e medio inferiore vel parte paullo altiore pinnatinervia, nervis ca. 6+7, lucida, supra obscure viridia et glabra, subtus pallidiora, nervis pilis sursum curvis subvillosa, petiolo ca. 10+2 mm. longo dorso hirsuto; spicae visae juveniles breves breviter pedunculatae; bracteae magnae pallidae fimbriatae.—Guatemala: In flat-land forest near La Libertad, Dept. Petén, April 7, 1933, *C. L. Lundell 2565* (type in herb. Univ. Illinois). Also *No. 4886* from the same locality.

Piper emancipationis Trelease, sp. nov.—Frutex vel suffrutex nodosus, internodiis primo brevibus gracilibus persistente griseo-velutinis; folia elliptico-ovata subabrupte acuminata, basi rotundata altero latere breviore, 10 cm. longa atque 5 cm. lata vel saepius

17–22 cm. longa atque 9–11 cm. lata, e medio inferiore vel e parte paullo altiore pinnatinervia, nervis ca. 5+6, subtus adpresso-pilosa, in sicco firmo-papyracea lucida, petiolo 5+3 mm. longo vel in foliis inferioribus reductis 15 mm. longo ubique vaginante transiente piloso; spicae visae juveniles parvae breviter pedunculatae; bracteae magnae pallidae triangulari-subpeltatae fimbriatae.—Guatemala: Flat-land forest near La Libertad, Dept. Petén, June 7, 1933, *C. L. Lundell 3658* (type in herb. Univ. Illinois).

Piper emancipationis Trelease, var. **longum** Trelease, var. nov.—Folia magis elongato-elliptica, ad 24 cm. longa atque 10 cm. lata.—Guatemala: Limestone valley forest near La Libertad, Dept. Petén, April 27, 1933, *C. L. Lundell 3052* (type in herb. Univ. Illinois). Maya name *pooczuyaax*.

Piper instabilipes Trelease, sp. nov.—Frutex nodosus glaber, internodiis floriferis brevibus gracillimis; folia lanceolato-ovata anguste acuminata, superiora basi acuta, petiolo exalato, inferiora basi rotundata, petiolo alato, 10–14 cm. longa 4–6 cm. lata, e medio inferiore submultiplinervia, nervis 4×2, costa superne nervos teneros arcuatos paucos emittente, petiolo 10–15 mm. longo; spicae 80 mm. longae 2 mm. crassae, pedunculo 5 mm. longo; bracteae rotundo-subpeltatae; stigmata 3 sessilia.—Guatemala: High, upland forest near Santa Teresa, Subín River, Dept. Petén, April 14, 1933, *C. L. Lundell 2776* (type in herb. Univ. Illinois).

Piper Lundellianum Trelease, sp. nov.—Frutex gracillimus, ramis fuscis transiente velutinis; folia rotundo-ovata subabrupte acuminata, basi subacuta vel saepius brevissime truncato-cordata, aliquanto unguiculata, 9–12 cm. longa 5–10 cm. lata 7-nervia aliquanto venosa viridia essentialiter glabra, petiolo 5–10 mm. longo velutino; spicae 45 mm. longae 2 mm. crassae densiflorae, pedunculo 5 mm. longo velutino; bracteae cucullatae ciliatae.—Guatemala: In the village of La Libertad, Dept. Petén, May 31, 1933, *C. L. Lundell 3524* (type in herb. Univ. Illinois).

Piper nitidulilaminum Trelease, sp. nov.—Frutex, internodiis floriferis breviusculis gracilibus subvillosis sed partibus infra nodos exceptis glabrescentibus; folia lanceolato-elliptica acuminata, basi acuta latere altero aliquanto breviore, ca. 15 cm. longa atque 6 cm. lata, e medio inferiore pinnatinervia nervis 5–6×2, in sicco tenuiter papyracea, supra lucida, nervis subtus aliquanto breviter pubescentibus, petiolo ca. 8+2 mm. longo breviter villoso; spicae juveniles 60 mm. longae 3 mm. crassae apiculatae, pedunculo 5 mm. longo glabrato; bracteae rotundo- vel crescentico-subpeltatae pallidae longiciliatae.—Guatemala: In secondary bush at Remate, Lake Petén, Dept. Petén, March 25, 1933, *C. L. Lundell 2077* (type in herb Univ. Michigan).

Piper plumbeicolor Trelease, sp. nov.—Frutex, internodiis floriferis brevibus gracilibus lucidis subtomentosis; folia elliptico-subovata acute acuminata, basi rotundata altero latere aliquanto breviore, 15 cm. longa 8 cm. lata, lucida, supra obscure viridia rugescentia, subtus plumbea, praesertim ad nervos crispo-pubescentia, petiolo ca. 8+2 mm. longo piloso; spicae juveniles 20 mm. longae 2 mm. crassae cuspidatae, pedunculo brevissimo; bracteae rotundo-subpeltatae fimbriatae.—Guatemala: In marginal forest near La Libertad, Dept. Petén, April 7, 1933, *C. L. Lundell 2554* (type in herb. Univ. Illinois).

Piper quadratilimbum Trelease, sp. nov.—Frutex altus, internodiis superioribus breviusculis gracilibus dense subretrorse pallido-pilosis; folia elliptico-subrhombea acuminata, basi angustata inaequilateraliter obtusa, 14–16 cm. longa 7–9 cm. lata, e medio inferiore pinnatinervia, nervis 6×2, supra minute pubescentia sed cito granuloso-subscabrida, subtus dense pallido-pubescentia, petiolo 7+3–10+5 mm. longo subvilloso; spicae ca. 70 mm. longae atque 3 mm. crassae, pedunculo 10 mm. longo pubescente; bracteae triangulari-subpeltatae pilosae; baccae triquetrae truncatae; stigmata 3 sessilia.—Guatemala: In high upland forest near El Paso, Dept. Petén, April 14, 1933, *C. L. Lundell 1488* (type in herb. Univ. Michigan).

Piper rematense Trelease, sp. nov.—Frutex, internodiis floriferis subgracilibus brevibus striatis ad nodos pilosulis; folia elliptica vel subrhombea acuminata, basi acuta interdum obscure unguiculata, 9–11 cm. longa 4.5–6.5 cm. lata 5-nervia, nervis subtus sparse pilosis, petiolo 5–10 mm. longo subvilloso; spicae 35–40 mm. longae 2–3 mm. crassae, pedunculo 5 mm. longo villoso; bracteae subspathulatae pilosae; ovarium oblongum, stigmatibus 3 erectis.—Guatemala: In an inhabited clearing, Remate, Lake Petén, Dept. Petén, Guatemala, March 25, 1933, *C. L. Lundell 2087* (type in herb. Univ. Michigan).

Piper simulhabitans Trelease, sp. nov.—Frutex 2-metralis, ramis et petiolis (? atque pagina inferiore laminae) primo floccosis; folia ovata acuminata, basi obtusa aliquanto revoluto-cordulata, 7.5–12 cm. longa 4.5–8 cm. lata 5–7-nervia, petiolo 5–15 mm. longo;

spicae 50 mm. longae 3 mm. crassae, pedunculo 5 mm. longo; bracteae subcucullatae pilosae.—Guatemala: In secondary forest near Remate, Lake Petén, Dept. Petén, March 25, 1933, *C. L. Lundell 2073* (type in herb. Univ. Michigan).

Piper tikalense Trelease, sp. nov.—Frutex 2–3-metralis, internodiis floriferis brevibus gracillimis hispidis vel hirsutis; folia ovata vel lanceolato-ovata protracto-acuminata, basi inaequaliter rotundata, 10–13 cm. longa 3.5–5 cm. lata, e medio inferiore pinnatinervia, nervis 4–5×2, supra granuloso-scabra, subtus ad nervos hirsuta vel subvillosa, plus minusve rugulosa, petiolo 10 mm. longo hirsuto; spicae 45–50 mm. longae 3 mm. crassae, pedunculo 3 mm. longo hispido; bracteae rotundato-subpeltatae albo-ciliatae.—Guatemala: In forest at Tikal, Dept. Petén, April 12–15, 1931, *H. H. Bartlett 12595* (type in herb. Univ. Illinois).

Piper yalochanum Trelease, sp. nov.—Frutex 2–3-metralis, internodiis floriferis brevibus gracilibus scabro-hispidis vel hirsutis; folia lanceolata subcaudato-acuminata, basi inaequilaterali latere longiore rotundata, 14 cm. longa 2.5–4 cm. lata, e tertio infimo pinnatinervia, nervis impressis 4–5×2, aliquanto rugosa, supra granulosa, subtus ad nervos patenti-pubescentia, petiolo 5 mm. longo hirsuto; spicae 70 mm. longae 3 mm. crassae, pedunculo vix 5 mm. longo hirsuto; bracteae rotundo-subpeltatae ciliatae.—Guatemala: In ramón forest along the Dos Arroyos-Yaloch Trail, Dept. Petén, May 2, 1931, *H. H. Bartlett 12849* (type in herb. Univ. Illinois).

Piper yaxhanum Trelease, sp. nov.—Frutex 2–3-metralis, ramis nigrescentibus crispo-pubescentibus; folia ovata acuminata, basi sensim vel subito acuta, 7-nervia, 8–12 cm. longa 4–8 cm. lata, ad nervos pubescentia et interdum subtus quoque inter nervos pubescentia, petiolo 5–20 mm. longo crispo-pubescente; spicae 40–50 mm. longae 2 mm. crassae, pedunculo 8–10 mm. longo.—Guatemala: In forest shade along the Yaxha-Remate road, Dept. Petén, June 16, 1933, *C. L. Lundell 3826* (type in herb. Univ. Illinois).

ULMACEAE

Ampelocera Hottlei Standl. Trop. Woods 51: 11. 1937. *Celtis Hottlei* Standl. op. cit. 20: 20. 1929.—Mexico: Ubero, Oaxaca, 30–90 meters, June, 1937, *L. Williams 9497*. Vernacular name Cautivo. A tree 13–21 meters high, the crown rounded or spreading; trunk 35–60 cm. in diameter, unbranched for 7 meters, often

with 5 narrow buttresses; bark grayish brown, fairly smooth. Said to be known also by the name Frijolillo. The genus is new for Mexico.

Ulmus LeSueurii Standl., sp. nov.—Ramuli graciles teretes griseo-brunnescentes lenticellis paucis albidis conspersi, novellis dense pilis laxis albidis adscendentibus vel subadpressis pilosis, internodiis brevibus; stipulae deciduae conspicuae brunneae striatae lanceolato-oblongae acutae plerumque 5–7 mm. longae; folia parva brevissime petiolata firma, petiolo ad 4 mm. longo dense patenti-piloso; lamina oblongo-elliptica 3.5–5.5 cm. longa 1.7–2.5 cm. lata acuta vel subacuminata, basi anguste rotundata, basi ipsa subcordata vel interdum truncata, in toto margine subdupliciter arcte crenato-serrata, serraturis subpatentibus, id est non incurvis, subulato-mucronatis, supra in sicco laete viridis ubique pilis brevibus et longis intermixtis subadpressis vel subpatentibus pilosa, tactu mollis, subtus paullo pallidior similiter pilosula, costa gracili elevata, nervis lateralibus utroque latere ca. 14 prominulis rectis in marginem desinentibus.—Mexico: Río Bonito, Chihuahua, August 24, 1936, *Harde LeSueur 595* (type in Herb. Field Mus.).

The type material, unfortunately, is in sterile and rather young condition, but the leaf characters are such that there is no doubt that the tree represents a tree distinct from other Mexican species of *Ulmus*. Evidently it is similar to *U. divaricata* C. H. Mueller, of Nuevo León, which has often long-acuminate leaves, very scabrous on the upper surface, with relatively appressed serrations.

MORACEAE

Brosimum terrabanum Pittier, Contr. U. S. Nat. Herb. 18: 68. *f. 76.* 1914.—This large tree, so common along the Atlantic coast of Central America, has not been recorded from Mexico, but the following collections made in 1937 are now available: Fortuño, Coatzacoalcos River, Veracruz, at 30–50 meters, *L. Williams 8950, 8583, 8387A;* Ubero, Oaxaca, 30–90 meters, *Williams 9179, 9394, 9489.* Local names Ojoche blanco, Ojoche de hoja menuda, Ojochillo. A tree of 18–27 meters, the trunk often 60 cm. or more in diameter, sometimes with narrow buttresses, the bark dark brown or almost black. The leaves are reported to be much eaten by cattle.

Piratinera panamensis Pittier, Contr. U. S. Nat. Herb. 20: 100. *pl. 7.* 1918.—This tree has been known to range from Panama to British Honduras, and may now be reported from Mexico: Ubero, Oaxaca, 30–90 meters, May, 1937, *L. Williams 9391*. Vernacular name Asta. A tree 22 meters or more in height, the crown usually narrow; trunk straight or nearly so, not buttressed, the bark grayish brown, fairly smooth; fairly common on dry slopes in the forest. The genus is new for Mexico, but there is some question as to whether it is really separable from *Brosimum*.

LORANTHACEAE

Phoradendron aurantiacum Trelease, sp. nov.—*Aequitoriales-Undulatae*(?). Pseudodichotoma granulosa in sicco aureobrunnea, ramis breviusculis cataphyllis basalibus tantum onustis, androgyna(?); internodii breviusculi teretes 30–40 mm. longi 2–4 mm. crassi; cataphylla annulari-bifida albomarginata; folia lanceolata obtusissima 4–5 cm. longa 1.5–2 cm. lata solemniter opaca obscure pinnatinervia, basi vix 10 mm. longe acute contracta; spicae subsolitariae fere sessiles graciles, adultae 30 mm. longae, articulis ca. 10 brevibus, floribus 12 vel paucioribus in series 4 vel 4+2 dispositis, squamis magnis.—Guatemala: On a tree in Sabana Zis, Lake Petén, Dept. Petén, May 3, 1933, *C. L. Lundell 3191* (type in herb. Univ. Illinois).

Phoradendron franciscanum Trelease, sp. nov.—*Aequitoriales-Quadrangulares.* Aliquanto pseudodichotoma glabra paullo rugulosa vel granulosa, cataphyllis tantum basalibus, androgyna(?); internodii 40 mm. longi 2–3 mm. crassi acute quadrangulares superne aliquanto compressi; cataphylla fere distincta albomarginata; folia elliptico-oblanceolata obtusa 2.5–3 cm. longa 1 cm. lata cuneatim subsessilia crispata, obscurissime basinervia; spicae plerumque solitariae vix 30 mm. longae, articulis ca. 4 oblongis ca. 12-floris, floribus 4-seriatim dispositis, pedunculo 3 mm. longo; fructus ruber globosus 3 mm. diam.; sepala inflexa.—Guatemala: On a tree in Sabana San Francisco, near La Libertad, Dept. Petén, April 1, 1933, *C. L. Lundell 2398* (type in herb. Univ. Illinois). La Libertad, *Lundell 3834*.

Phoradendron libertadanum Trelease, sp. nov.—*Aequitoriales-Quadrangulares.* Copiose ramosa glabra, interdum obscure hinc inde granulosa, cataphyllis ramorum tantum basalibus, internodiis 30–60 mm. longis 2–6 mm. crassis acute quadrangularibus superne ancipitibus; par cataphyllorum 1 basale, cataphyllis patentibus pallido-marginatis; folia oblonga mucronato-acuta circiter 30 mm. longa atque 5 mm. lata, cuneatim 5 mm. longe subpetiolata, crispata, obscurissime basinervia; inflorescentia?—Guatemala: Growing on

Cochlospermum vitifolium in marginal forest, La Libertad, Dept. Petén, April 1, 1933, *C. L. Lundell 2401* (type in herb. Univ. Illinois). La Libertad, *Aguilar 12.*

Vernacular name Matapalo.

Phoradendron petenense Trelease, sp. nov.—*Aequitoriales-Quadrangulares.* Majuscula copiose ramosa glabra, plus minusve ruguloso-granulosa; androgyna(?); internodii modici 40–60 mm. longi 2–4 mm. crassi acute quadrangulares, superne aliquanto compressi; par cataphyllorum 1 basale, cataphyllis brevibus fere distinctis; folia elliptico-oblonga obtusa aliquanto mucronata 4–6 cm. longa 1–2 cm. lata, cuneatim subsessilia, subtenuia tenuiter basinervia; spicae plerumque solitariae longiusculae 40 mm. longae, articulis ca. 4 elongatis atque 4-seriatim 16-floris, pedunculo ca. 5 mm. longo; fructus ruber globosus laevis 4 mm. diam., sepalis arcte inflexis.—Guatemala: On *Curatella americana*, La Libertad, Dept. Petén, April 1, 1933, *C. L. Lundell 2400* (type in herb. Univ. Illinois).

Struthanthus guatemalensis Standl., sp. nov.—Frutex epiphyticus gracilis ramosus, ramis gracilibus subflexuosis subangulatis praesertim ad angulos dense ferrugineo-furfuraceis, internodiis brevibus vel elongatis; folia modica breviter petiolata subcoriacea fragilia, petiolo graciusculo 4–6 mm. longo anguste canaliculato glabro; lamina oblongo-ovata 4–5.5 cm. longa 2–2.5 cm. lata apice anguste rotundata, basi acuta vel obtusa, marginata, marginibus minute ferrugineo-furfuraceis, utrinque opaca, concolor, costa subtus prominente tenui furfuracea, lamina aliter glabra, nervis venisque utrinque prominulis teneris, nervis lateralibus utroque latere 4–5 angulo angusto adscendentibus; spicae axillares solitariae 1–1.5 cm. longae vix ultra 7 mm. longe pedunculatae, articulis ca. 5 bifloris, bracteis latissimis rotundatis patentibus, floribus solitariis sessilibus; fructus immaturus oblongus 3 mm. longus sparse minute tuberculatus.—Guatemala: Finca Mocá, 900 meters, April 5, 1931, *J. Bequaert 46* (type in Herb. Field Mus.).

ARISTOLOCHIACEAE

Aristolochia Cardenasii Standl., sp. nov.—Herba scandens vel prostrata, caulibus gracilibus striatis subsparse breviter hirsutis, internodiis breviusculis; folia modica longipetiolata membranacea, petiolo crassiusculo 4.5–7 cm. longo striato breviter hirsuto; lamina reniformis integra ca. 6 cm. longa atque 9 cm. lata apice latissime rotundata vel fere truncata, basi profunde cordata et breviter decurrens, lobis basalibus latissime rotundatis, supra subsparse minute puberula, tactu laevis, subtus fere concolor dense pilis brevibus patentibus inferne incrassatis pilosa, basi 5-nervia; flores axillares solitarii ca. 1.5 cm. longe pedunculati, bractea ut videtur caduca; ovarium lineare dense pilosum; calyx extus dense pilis longis laxis patentibus pilosus, utriculo subgloboso 1.5 cm. longo, tubo deflexo arcuato 1.5 cm. longo vel ultra nervoso, labio orbiculari 3 cm. longo et aequilato apice obtuso vel subrotundato et cuspidato-mucronato, basi profunde anguste cordato, margine appendicibus filiformibus apice paullo incrassatis ca. 8 mm. longis dense ciliato.—Bolivia: Charagua, Chaco Region, 700 meters, climbing or repent on sandy, rather damp soil, April, 1934, *Martín Cárdenas 2618* (type in Herb. Field Mus.).

"Flowers purple and yellow."

Aristolochia Marshii Standl., sp. nov.—Herbacea volubilis, caule ut videtur simplici gracillimo sparse pilis brevibus laxis albidis piloso, internodiis elongatis; folia modica longipetiolata herbacea, petiolo gracili 1–3.5 cm. longo sparse piloso; lamina profunde fere ad basin triloba 6–9 cm. longa, basi profunde cordata, sinu lato aperto, lobo terminali anguste oblongo ad 1.5 cm. lato fere e basi ad apicem sensim attenuato, lobis lateralibus semiovatis obtusis multo brevioribus, lamina supra viridi sparse breviter pilosula, subtus paullo pallidiore ad nervos breviter pilosula et inter nervos minutissime puberula vel glabrata, basi 5-nervia; flores axillares solitarii ca. 1 cm. longe pedunculati, bractea lineari-lanceolata basi acuta fere 1 cm. longa; ovarium ca. 5 mm. longum lineari-oblongum dense patenti-pilosum; calyx extus subdense patenti-pilosus, utriculo obovoideo ca. 8 mm. longo, tubo subrecto fere 1 cm. longo 2 mm. vel paullo ultra lato, limbo recto complicato fere 3 cm. longo et basi 1 cm. lato longe anguste apicem obtusum versus attenuato, lobis basalibus brevissimis basi subauriculatis.—Mexico: Muzquiz, Coahuila, Spring of 1935, *Ernest G. Marsh 10* (type in Herb. Field Mus.). Probably conspecific is *C. H. & M. T. Mueller 311* from Diente Canyon, near Monterrey, Nuevo León, collected in July, 1933.

The plant is closely related to *A. brevipes* Benth., a very variable species, as generally interpreted, but it differs sufficiently from that in the large, deeply lobed leaves with narrow lobes, and in the narrow, not cordate bracts.

Aristolochia martiniana Standl., sp. nov.—Herbacea scandens ramosa, caulibus gracilibus glabris, internodiis valde elongatis; folia modica longipetiolata membranacea, petiolo gracili glabro ca. 2 cm. longo; pseudostipulae subrotundatae deciduae ca. 8 mm. longae; lamina hastata ca. 7.5 cm. longa et basi 4.5 cm. lata, paulo infra medium subcontracta, longiacuminata, basi profunde late cordata, lobis posticis anguste rotundatis subretrorsis, in sicco fusca, glabra vel subtus prope basin obscure minute puberula, basi 5–7-nervia; flores axillares solitarii 5–6.5 cm. longe pedunculati, bractea caduca vel obsoleta; ovarium lineare ad 2 cm. longum vix 2 mm. latum glabrum; calyx glaber, utriculo ovali 2–3 cm. longo 1–2 cm. lato, tubo ex utriculo angulo recto divergente brevi crasso, labio ovali 7.5 cm. longo 4 cm. lato apice rotundato et 3 mm. longe mucronato, basi profunde cordato, lobis basalibus rotundatis.—Peru: Juanjuí, Alto Río Huallaga, Dept. San Martín, 400–800 meters, in forest clearing, December, 1935, *G. Klug 4168* (type in Herb. Field Mus.).

"Flowers wine-red and yellow."

Aristolochia quercetorum Standl., sp. nov.—Herba prostrata, caulibus ut videtur simplicibus gracilibus flexuosis dense patenti-pilosis, internodiis brevibus; folia inter minora breviter petiolata membranacea, petiolo crassiusculo 7–9 mm. longo hirtello; lamina oblongo-sagittata vel in foliis infimis interdum triangulari-sagittata 4–7.5 cm. longa 2–2.5 cm. lata apicem obtusum vel acutiusculum versus sensim angustata, basi profunde (ad 1.5 cm.) anguste cordata, lobis basalibus anguste rotundatis vel obtusis retrorsis, supra minute puberula et asperula vel glabrata, subtus paullo pallidior ad nervos hirtella et inter nervos scaberulo-puberula, basi 5-nervia; flores axillares solitarii ca. 4 mm. longe pedunculati, bractea late ovata viridi obtusa 2.5 mm. longa pilosa; ovarium 5 mm. longum anguste oblongum dense hirtellum; calyx extus dense hirtellus, utriculo ovoideo fere 1 cm. longo atque 7 mm. lato, tubo lato 4 mm. tantum longo, labio rotundato-ovato 1 cm. longo vel paullo ultra obtuso, basi utroque latere subauriculato, auriculis late rotundatis; capsula 1.5 cm. longa brevissime hirtella, valvulis 6–7 mm. latis.—Mexico: Guasaremos, Río Mayo, Chihuahua, in oak flat, September 26, 1935, *Howard Scott Gentry 1872* (type in Herb. Field Mus.).

Vernacular name Yerba del indio. A decoction of the roots is a local remedy for gas on the stomach and is employed as a wash for sores.

POLYGONACEAE

Coccoloba chacoensis Standl., sp. nov.—Frutex 2–3-metralis, ramulis flexuosis gracilibus teretibus griseobrunnescentibus glabris, novellis minute puberulis, internodiis brevibus vel elongatis; ocreae parvae puberulae caducae; folia parva petiolata subcoriacea, petiolo crassiusculo 4–8 mm. longo minute ciliolato; lamina late elliptica vel ovato-elliptica 2.5–5 cm. longa 1.5–3.2 cm. lata obtusa vel interdum apice anguste rotundata, basi rotundata et saepe breviter emarginata, glabra, supra opaca, costa nervisque prominentibus, subtus paullo pallidior, costa gracili prominente, nervis lateralibus utroque latere ca. 7 angulo latiusculo adscendentibus prominulis teneris fere rectis justa marginem conjunctis, venulis obscure laxe reticulatis, lamina subtus ubique densiuscule fusco-puncticulata; flores sessiles spicati, spicis terminalibus 4.5–9 cm. longis breviter pedunculatis interruptis, floribus remotis ut rhachi glabris, ocreolis vix 1 mm. longis; perianthii segmenta rotundato-ovalia apice rotundata viridia 1.5 mm. longa fere ad basin distincta.—Bolivia: Cururenda, Chaco Region, 200 meters, in sandy loam, March, 1934, *Martín Cárdenas 2529* (type in Herb. Field Mus.).

"The leaves are like coca when chewed." The species is noteworthy for its conspicuously small leaves.

CHENOPODIACEAE

Halogeton sativus (L.) C. A. Mey.—Some time ago Prof. A. O. Garrett sent to the writer material of a Chenopodiaceous plant which offered considerable difficulty in determination. It was finally identified by Dr. Paul Aellen, authority upon this group, as *Halogeton sativus* (L.) C. A. Mey. (*Salsola sativa* L.), a species native in southern Spain and Algeria. The plant was collected in August, 1935, at Wells, Nevada, by Ben Stahmann. It was found along railroad tracks, where it is reported to be spreading rapidly. It will be interesting to learn whether this new addition to the United States flora thrives as well as *Bassia hyssopifolia* (Pall.) Kuntze, a related plant of somewhat similar appearance, which, if I remember correctly, also was found in the United States first in Nevada.

AMARANTHACEAE

Amaranthus Parodii Standl., sp. nov.—Herba annua erecta 18–30 cm. alta e basi ramosa, caulibus crassis teretibus vel obscure obtuse angulatis pallidis glabris vel superne sparsissime villosulis, internodiis brevibus; folia inter minora longissime petiolata herbacea, petiolo gracili 1.3–2.5 cm. longo glabro vel sparse villosulo; lamina ovato-rhombea in sicco interdum complicata 2–3.5 cm. longa 1.2–2 cm. lata apicem retusum et mucronatum versus angustata, basi cuneata vel obtusa et abrupte longe decurrens, glabra vel subtus ad nervos sparse villosula, nervis lateralibus utroque latere ca. 6 angulo semirecto adscendentibus pallidis conspicuis; flores monoeci glomerulati, glomerulis magnis dense multifloris axillaribus et petiolis multo brevioribus, vel saepe spicam densam terminalem foliosam ca. 12 mm. crassam efformantibus; bracteae glabrae lucidae late ovatae sepalis femineis fere duplo breviores mucronatae; sepala femina spathulato-obovata 2 mm. longa prope medium contracta et longe in unguiculam angustam decurrentia, apice late rotundata vel subtruncata et breviter mucronata glabra erecta integra; utriculus sepalis paullo brevior apice tridentatus rugosus, ut videtur indehiscens; semen nigrum lucidum 1.2 mm. latum laeve.—Argentina: Amaicha, Prov. Tucumán, in maize fields, 2,300 meters, February 2, 1933, *L. R. Parodi 11040* (type in Herb. Field Mus.). Vera, Prov. Santa Fe, 60 meters, November 13, 1933, *Parodi 11277*.

Vernacular name Ataco.

Iresine Cardenasii Standl., sp. nov.—Frutex 2-metralis ramosus, ramis gracillimis teretibus densissime arcte albo-stellato-tomentosis, internodiis elongatis; folia modica breviter petio lata papyracea, petiolo crassiusculo 7–10 mm. longo; lamina oblongo-lanceolata vel anguste elliptico-oblonga 7–11 cm. longa 2–3.8 cm. lata apicem acutiusculum versus sensim attenuata, basi acuta vel acuminata, supra in sicco viridis opaca, primo laxe tomentosa, cito glabrata, costa nervisque manifestis sed non elevatis, subtus dense arcte albo-stellato-tomentosa, costa gracili elevata, nervis lateralibus utroque latere ca. 12 angulo lato adscendentibus subarcuatis prominentibus; flores dioeci, spiculis parvis numerosissimis laxe paniculatis, paniculis magnis foliosis usque 27 cm. latis; spiculae plerumque 5–8 mm. longe pedunculatae ca. 4 mm. latae ovoideae vel subglobosae; bracteae et bracteolae rotundato-ovatae hyalinae obtusae et apiculatae glabrae sepalis aequilongae; sepala floris feminei 1.5 mm. longa oblonga acutiuscula dense pilis longissimis albis pilosa.—Bolivia: Sailapata, Prov. Ayopaya, Dept. Cochabamba, 2,000 meters, dry, rocky places, October, 1935, *Martín Cárdenas 3210* (type in Herb. Field Mus.).

NYCTAGINACEAE

Mirabilis Muelleri Standl., sp. nov.—Herba ut videtur decumbens et laxa ramosa, ramis gracilibus subteretibus sparse vel superne dense puberulis, internodiis foliis longioribus; folia parva longipetiolata herbacea, petiolo gracili 7–13 mm. longo sparse puberulo vel glabro; lamina forma variabilis late deltoideo-ovata vel late rotundato-ovata, interdum latior quam longa, 1.5–3 cm. longa 1.3–2.3

cm. lata, versus apicem obtusum vel acutum angustata vel interdum apice late obtusa et apiculata, basi breviter cordata vel truncata, glabra, rhaphidibus brevibus solemniter notata, basi 3–5-nervia, costa utroque latere nervos 1–2 emittente; involucra axillaria et solitaria vel apice rami subcymosa, pedunculis ad 12 mm. longis gracillimis glanduloso-villosulis; involucrum triflorum viride ad anthesin 8 mm. longum late campanulatum dense breviter glanduloso-villosulum infra medium 5-lobum, lobis late ovatis acutiusculis; anthocarpium juvenile breviter pilosulum angulatum; perianthium 18 mm. longum vel ultra, tubo extus villosulo fauce ad 4 mm. lato sensim a basi ad faucem dilatato.—Mexico: La Mina, mountains near Monterrey, Nuevo León, July, 1933, *C. H. & M. T. Mueller 49* (type in Herb. Field Mus.).

Related to *M. longipes* Standl., described from Durango, which has acute or attenuate leaves deeply cordate at the base, and smaller involucres.

Torrubia asperula Standl., sp. nov.—Arbor; ramuli teretes fusco-ferruginei lenticellis paucis magnis elongatis notati, internodiis brevibus, novellis subdense ferrugineo-villosulis; folia plerumque ternata parva breviter petiolata subcoriacea, petiolo 5–8 mm. longo ferrugineo-villosulo; lamina elliptico-oblonga vel anguste elliptico-oblonga 5–7 cm. longa 1.8–2.5 cm. lata acuminata, basi acuta, supra in sicco lucida glabra, nervis venulisque prominulis, subtus brunnescens sublucida asperulo-puberula vel ad nervos ferrugineo-villosula, costa gracili elevata, nervis lateralibus utroque latere ca. 10 angulo fere recto divergentibus fere rectis irregularibus prope marginem arcuato-conjunctis, venis prominulis laxe reticulatis, margine vulgo recurvo; inflorescentiae numerosae laxe multiflorae 2.5–4 cm. longe graciliter pedunculatae 3–3.5 cm. longae et paullo latiores, basi vulgo trichotomae vel ramis interdum verticillatis gracillimis fere glabris, nodis plus minusve ferrugineo-villosulis, floribus cymosis vel subumbellatis, pedicellis ad 3.5 mm. longis, saepe fere nullis, bracteis minutis obscuris; perianthium masculum 4 mm. longum e basi faucem 2 mm. latum versus sensim dilatatum, sparse minutissime ferrugineo-puberulum vel glabrum, dentibus brevissimis obtusis; stamina breviter exserta.—Brazil: Parati, Santa Catharina, October 25, 1928, *F. C. Hoehne 23182* (type in Herb. Field Mus.).

Torrubia Hoehnei Standl., sp. nov.—Arbor magna; ramuli crassiusculi subteretes dense arcte ferrugineo-tomentosi, internodiis brevibus; folia majuscula opposita vel rarius ternata petiolata papyraceo-coriacea, petiolis inaequalibus 6–25 mm. longis ferrugineo-tomentosis; lamina ovato-oblonga vel elliptico-oblonga, rare elliptica vel subrotundata, vulgo 9–18 cm. longa atque 4.5–7 cm. lata, breviter acuminata vel acuta, basi interdum valde obliqua obtusa vel subrotundata, supra in sicco fusca sublucida vel fere opaca, primo sat dense ferrugineo-puberula serius glabrata, costa prominula, nervis manifestis sed vix elevatis, subtus fere concolor dense minute ferrugineo-tomentosa, costa gracili elevata, nervis lateralibus utroque latere ca. 11 prominulis angulo lato interdum fere recto abeuntibus subarcuatis, venulis inconspicuis laxe reticulatis; inflorescentiae cymoso-corymbosae erectae sublaxe multiflorae 2–5 cm. longe pedunculatae ca. 5 cm. latae, pedunculo crassiusculo dense ferrugineo-tomentoso, ramis basalibus crassiusculis subpatentibus dense ferrugineo-tomentosis, floribus plerumque sessilibus cymoso-congestis, bracteis parvis dense tomentosis; perianthium masculum 2.5–3 mm. longum late campanulatum basi acutum minute ferrugineo-tomentulosum truncatum et remote brevissime denticulatum; stamina ca. 7 perianthio plus quam duplo longiora; fructus immaturus oblongus 7 mm. longus 2.5–3 mm. latus apice contractus, primo sparse ferrugineo-tomentulosus cito glabratus.—Brazil: Iguape, São Paulo, September 21, 1929, *F. C. Hoehne 24825* (type in Herb. Field Mus.). Praia Grande, São Paulo, November 10, 1898, *Alb. Loefgren 12942* (*Herv. Com. Geogr. e Geol. de S. Paulo 4208*). Cubatão, S. Paulo, August 23, 1899, *Hoehne 23855*.

An apparently well marked species of this genus that is so amply represented in Brazil, noteworthy especially for the abundant, ferruginous pubescence found on almost all parts of the plant.

Torrubia Loefgrenii Standl., sp. nov.—Rami graciles teretes brunneo-ochracei lucidi glabri, internodiis elongatis; folia majuscula opposita sessilia amplectantia (ad summum vix 2 mm. longe petiolata) oblonga, elongato-oblonga vel lanceolato-oblonga 11–15.5 cm. longa 4–5.5 cm. lata acuta vel breviter acuminata, apice ipso obtuso vel subacuto, basi rotundata vel subcordata, papyracea, supra in sicco fuscescentia lucida, nervis venisque parum conspicuis vix prominulis, utrinque glabra, subtus lucida, costa gracili prominente, nervis lateralibus utroque latere ca. 15 angulo fere recto divergentibus rectis sed irregularibus; inflorescentia mascula axillaris graciliter 4–4.5 cm. longe pedunculata cymoso-paniculata pauciramosa ca. 3.5 cm. longa atque aequilata, ramis gracilibus angulo lato adscendentibus glabris vel ad nodos inconspicue ferrugineo-puberulis, bracteis minutis deciduis, floribus aggregatis sessilibus vel subsessilibus;

perianthium masculum 4 mm. longum sensim e basi ad faucem 2 mm. latum dilatatum glabrum, dentibus brevissimis obtusis; stamina breviter exserta.—Brazil: São Sebastião, São Paulo, July 26, 1895, *Alb. Loefgren* (*Herv. Com. Geogr. e Geol. de S. Paulo 3061*) (type in Herb. Field Mus.).

The outstanding character of the species is found in the sessile leaves.

CARYOPHYLLACEAE

Cerastium guatemalense Standl., sp. nov.—Herba ut videtur perennis 30 cm. alta et ultra basi decumbens, radicibus non visis, caulibus graciusculis sat dense pilis laxis longiusculis patentibus pallidis viscido-villosis, internodiis numerosis, inferioribus foliis brevioribus, supremis foliis multo longioribus; folia linearia 2–3.5 cm. longa prope basin 2–4 mm. latis apicem angustum versus sensim attenuata 1-nervia utrinque sat dense pilis longis laxis viscidis basi subbulbosis villosa; inflorescentia laxe aperte ramosa ca. 20 cm. longa, ramis gracilibus dense viscido-villosis, cymis laxe paucifloris, floribus nutantibus, pedicellis gracilibus plerumque 1–3 cm. longis dense viscido-villosis; sepala 5–6 mm. longa oblongo-ovata acuminata viridia sat dense pilis longis laxis viscido-villosa, marginibus superne pallidis hyalinis; petala alba vix ultra 7 mm. longa; capsula subcurva 12–13 mm. longa medio 3.5 mm. lata hyalina 10-nervia, dentibus brevissimis; semina brunnea grosse tuberculata 1.2 mm. diam.—Guatemala: Volcán de Agua, presumably on the highest slopes toward the crater, July 22, 1937, *J. R. Johnston 816* (type in Herb. Field Mus.).

This is the first native species of *Cerastium*, so far as I know, to be recorded from Central America.

RANUNCULACEAE

Delphinium calcar-equitis Standl., sp. nov.—Perennis elata 60 cm. alta vel ultra, caule infra inflorescentiam simplici gracili tereti glabro versus basin purpureo tincto; folia basalia non visa, caulinis 2.5–9 cm. longe petiolatis, petiolo striato prope basin vaginato-dilatato et ciliato; lamina ambitu pentagona ca. 4.5 cm. longa atque 5.5 cm. lata fere ad basin tripartita, segmento terminali fere ad medium trilobo, lobis grosse 2–4-crenatis, crenaturis ovato-ovalibus apice constricto-apiculatis, apice purpurascente, segmentis lateralibus fere ad basin bilobis similiter crenatis, lamina basi profunde late cordata supra viridi sparse puberula et minute glandulosa, subtus glaucescente ad nervos venasque sparse pilosula; racemi simplices vel pauciramosi ca. 11 cm. longi laxissime pauciflori, rhachi sparse incurvo-pilosula, bracteis linearibus usque 1 cm. longis; pedicelli gracillimi, inferiores usque 5 cm. longi incurvo-pilosuli, bracteolis 2 versus apicem insertis anguste linearibus ca. 5 mm. longis; sepala intense violacea rotundato-ovata ca. 1 cm. longa obtusa extus sparse incurvo-pilosula, calcare recto 2 cm. longo obtuso basi 5 mm. lato apicem versus sensim attenuato; petala superiora albida glabra apice caeruleo suffusa et breviter bidentata, inferiora intense violacea bifida albo-barbata.—Mexico: Memelichi, Río Mayo, Chihuahua, 2,250 meters, on pine slope, September 13, 1936, *Howard Scott Gentry 2700* (type in Herb. Field Mus.).

A handsome and showy plant, noteworthy for the lax, few-flowered racemes, large flowers, and long spurs. Local name Espuela de caballero.

Delphinium valens Standl., sp. nov.—Perennis erecta, caule fistuloso-incrassato inferne 1 cm. crasso simplici striato dense foliato ubique sed non conspicue pilis brevibus laxis subpatentibus pallidis non viscidis piloso, ca. 60 cm. alto; folia numerosa densa, basalia non visa, caulina 2.5–5 cm. longe petiolata, petiolo piloso basi subdilatato; lamina utrinque pilis albidis subsparsis incurvis pilosa fere ad basin 5-partita, segmentis angustis basi cuneato-angustatis plus minusve trilobis, lobis profunde laciniato-lobulatis vel laciniato-serratis, serraturis oblongis vel anguste triangularibus apice obtusis et incrassatis vel subtruncatis; racemus simplex dense foliatus, foliis caulinis paullo minoribus, supremis subsessilibus, floribus subcongestis, pedicellis 1–3 cm. longis rigidis subincurvis sat dense pilis gracillimis longiusculis patentibus viscido-pilosis, apice bibracteolatis; flores perfecti non visi, calcare crasso incurvo ca. 1 cm. longo, sepalis ciliatis et parce pilosis aequilongis; folliculi 3 glabri, immaturi 6 mm. longi in stylum 3 mm. longum sensim attenuati.—Mexico: Abundant in upper pine woods, peak of Cerro Potosí, Municipio de Galeana, Nuevo León, July 21, 1935, *C. H. Mueller 2264* (type in Herb. Field Mus.).

The flowers are described as dark purple, fading with age. They appear to be of the dark, brownish purple that characterizes some of the species of the southern Rocky Mountains. Among all Mexican representatives of the genus this may be recognized at once by the short and densely congested, very leafy inflorescence and stout, densely leafy stems.

Ranunculus centellifolius Standl., sp. nov.—Herba perennis; folia basalia longissime petiolata numerosa, petiolo usque 9 cm.

longo striato sparse pilis longissimis albis adscendentibus induto vel fere omnino glabro; lamina rotundo-reniformis ca. 2.5 cm. longa et fere aequilata apice late rotundata, basi profunde anguste cordata, ubique grosse crenata, crenaturis utroque latere ca. 7 apice rotundatis, supra glabra, subtus pilis paucis longis albis induta vel fere glabra; caules plures 2–3-flori erecti vel adscendentes ad 21 cm. longi virides striati sparse longipilosi; folium caulinum vulgo 1 sessile vel subsessile tripartitum, segmentis oblongo-linearibus usque 2.2 cm. longis integris, interdum fere linearibus; flores longipedunculati, sepalis hyalinis fere 5 mm. longis orbicularibus extus subsparse laxe longipilosis; petala 5 obovato-rotundata 9 mm. longa apice late rotundata basi late cuneato-rotundata glabra venosa laete lutea; capitulum achaeniorum globosum, achaeniis numerosis glabris turgidis laevibus ovoideis 2 mm. longis subobtusis stylo recto erecto ca. 1 mm. longo terminatis.—Mexico: Abundant in meadows below timber line, peak of Cerro Potosí, Municipio de Galeana, Nuevo León, July 21, 1935, *C. H. Mueller 2250* (type in Herb. Field Mus.).

Apparently a handsome plant because of its rather large but not very numerous flowers, noteworthy for the rounded-reniform leaves, suggestive of those of the genus *Centella.*

Ranunculus palmifolius Standl., sp. nov.—Herba perennis, radicibus dense fasciculatis gracilibus sed carnosis; folia basalia numerosa longipetiolata, petiolo ad 8.5 cm. longo sparse longipiloso; lamina 3–4.5 cm. longa ut videtur plus minusve carnosa profunde triloba, basi cuneata et longe decurrens, lobo centrali integro vel breviter trilobo, lateralibus profundius trilobis, segmentis omnibus linearibus vel oblongo-linearibus 2–3.5 mm. latis obtusis vel acutiusculis; caules pauci crassiusculi ad 15 cm. alti multistriati sparse longipilosi vel fere glabri plerumque 3–4-flori; folia caulina pauca, inferiora usque 2.5 cm. longe petiolata, superiora sessilia, inferiora basalibus similia, superiora plerumque tripartita, segmentis linearibus; flores breviter pedunculati; sepala late oblonga obtusa ca. 5 mm. longa extus sparse pilosa; petala 5 late oblonga fere 1 cm. longa apice rotundata glabra ut videtur lutea; capitulum achaeniorum ovoideum, achaeniis immaturis ovoideis numerosis dense hirtellis in stylum longum erectum rectum sensim attenuatis.—Mexico: Vicinity of Madera, Chihuahua, May–June, 1908, *Edward Palmer 300* (type in Herb. Field Mus.).

The petioles weather into numerous stiff, brown fibers that are long-persistent at the base of the plant. The basal leaves are distinctive, suggesting an open palm with outspread fingers.

Ranunculus pentodontus Standl., sp. nov.—Herba perennis; folia basalia ut videtur pauca longipetiolata erecta, petiolo usque 9 cm. longo basi dilatato et vaginante dense pilis longissimis albidis sericeo-piloso; lamina anguste oblanceolato-oblonga 7–9 cm. longa 1.5–2 cm. lata acuta, basin versus longe sensim cuneato-attenuata, prope apicem vulgo 5-dentata, dentibus acutis, fere parallelonervia, nervis ca. 5 utrinque prominentibus, supra viridis sparse longipilosa vel fere glabra, subtus dense pilis longis albidis sericeo-pilosa; caules ut videtur pauci erecti vel adscendentes graciles usque 50 cm. alti, foliis caulinis paucis basalibus similibus sed angustioribus apice vulgo tridentatis, sessilibus vel subsessilibus, dentibus interdum linearibus et elongatis, foliis supremis brevibus anguste linearibus integris; flores ca. 6 vel plures longipedunculati, pedunculis gracilibus laxe tomentosis; sepala decidua ovalia hyalina ca. 6 mm. longa apice rotundata extus pilis longissimis dense sericeo-pilosa; petala 5 laete lutea late cuneato-rotundato-obovata ca. 8 mm. longa apice late rotundata glabra intus lucida; capitula achaeniorum globosa 7 mm. longa, achaeniis numerosis suborbicularibus turgidis sed ad margines paullo incrassatis compressis laevibus pallidis 2 mm. longis apice rotundatis dense minute pilosulis, stylo vix ad 1 mm. longo incurvo basi paullo incrassato.—Mexico: Memelichi, Río Mayo, Chihuahua, on gentle forest slope, pine woods, 2,250 meters, September 17, 1936, *Howard Scott Gentry 2787* (type in Herb. Field Mus.). Quebrada Honda, Durango, May, 1906, *Edward Palmer 220.*

Noteworthy for the elongate, narrow leaves, usually 5-dentate near the apex, and with a distinctive nervation that appears at first glance to be parallel.

LAURACEAE

Litsea Tharpiana Standl., sp. nov.—Ut videtur dense ramosa, ramis vetustioribus nigrescentibus, novellis cinnamomeis subteretibus densissime brunneo-tomentellis, internodiis brevibus; folia parva breviter petiolata coriacea, petiolo 3–4 mm. longo tomentello; lamina ambitu variabilis late ovata, rotundo-ovata vel rare fere orbicularis 1.5–3 cm. longa 1.5–2.3 cm. lata, apice acutiuscula usque rotundata, basi late rotundata vel subcordata, supra in sicco cinereo-viridis sublucida puberula vel glabrata, reti venularum prominula et minute reticulata, subtus pallida glauca densiuscule pilosulo-tomentella, costa gracili prominente, nervis lateralibus utroque latere ca. 6 angulo latiusculo adscendentibus arcuatis, venulis minutissime reticulatis atque retem prominentem efformantibus; capitula evoluta non visa, juvenilia axillaria solitaria vel bina breviter pedunculata recurva, pedunculo in statu fructifero 3 mm. tantum longo; fructus globosus apicatus 7 mm. diam.—Mexico: Hacienda Pablillo, Galeana, Nuevo León, August 21, 1936, *Mary Taylor 188* (type in Herb. Field Mus.).

A well marked species, distinguished by the short, broad leaves with unusually copious pubescence, especially on the lower surface. The species is named for Professor B. C. Tharp, who has forwarded to Field Museum for determination a vast quantity of valuable and unusually interesting material, collected in Trans-Pecos Texas and northeastern Mexico.

CRUCIFERAE

Lepidium macrum Standl., sp. nov.—Herba annua(?) erecta ca. 30 cm. alta, caulibus infra inflorescentiam simplicibus gracilibus rigidulis teretibus ubique subsparse pilis parvis stellatis sessilibus indutis, subdense foliatis; folia basalia non visa, caulina sessilia lineari-oblanceolata internodiis longiora plerumque 1–2.5 cm. longa usque 4 mm. lata obtusa, basin versus longe attenuata, superioribus minoribus, remote paucidentata vel subintegra utrinque subsparse stellato-pilosula; racemi pauci paniculati usque 10 cm. longi laxe multiflori, pedicellis rectangule patentibus 4–7 mm. longis stellato-puberulis; sepala ca. 1.5 mm. longa, petalis subaequilongis angustis albis vel purpurascentibus; siliqua ovalis vel obovato-ovalis 2.5 mm. longa et fere aequilata basi obtusa, apice truncata vel subemarginata, subdense minute stellato-puberula, stylo gracili 0.5 mm. longo vel ultra.—Mexico: Rare among shrubs of the upper canyons, Cañón de Los Capulines, above San Enrique, Hacienda San José de Raíces, Municipio de Derrumbadero, Nuevo León, August 6, 1935, *C. H. Mueller 2411* (type in Herb. Field Mus.).

ROSACEAE

Couepia calophlebia Standl., sp. nov.—Arbor 36-metralis, ramulis crassiusculis teretibus rimosis cinereo-ferrugineis, novellis dense adpresse arachnoideo-tomentosis, internodiis brevibus; folia parva breviter petiolata rigide coriacea, petiolo crasso 5–7 mm. longo adpresso-tomentoso; lamina elliptico-oblonga vel lanceolato-oblonga 5.5–8.5 cm. longa 2–3.5 cm. lata longiacuminata, basi acuta vel obtusa, supra in sicco lucida glabra, costa nervisque plus minusve impressis, venis obsoletis, subtus albida ubique tomento arcte adpresso araneoso obtecta, costa gracili elevata, nervis lateralibus utroque latere ca. 8 prominentibus gracilibus angulo semirecto adscendentibus subarcuatis marginem fere attingentibus, venulis prominentibus transversis parallelis et arcte reticulatis connexis; flores albi spicati, spicis sessilibus densissime multifloris foliis vulgo brevioribus, rhachi crassa dense fulvo-sericea, bracteis fulvo-sericeis ad 3 mm. longis deciduis; calycis tubus lineari-turbinatus 6 mm. longus extus ut sepala densissime fulvo-sericeus, sepalis 5–6 mm. longis oblongis obtusis; petala sepalis paullo longiora late oblonga glabra apice rotundata; stamina numerosa glabra sepalis duplo longiora; ovarium densissime fulvo-hirsutum.—Brazil: State of Amazonas, near mouth of Rio Embira, a tributary of Rio Tarauaca, on terra firma, June 19, 1933, *B. A. Krukoff 4913* (type in Herb. Field Mus.).

Couepia Dahlgrenii Standl., sp. nov.—Ramuli crassi teretes sordido-ochracei sat dense foliati, novellis dense albido-araneoso-tomentosis; stipulae ferrugineae lineares ca. 3 mm. longae extus tomentosae subpersistentes; folia parva brevissime petiolata rigide coriacea, petiolo crasso vix ultra 2 mm. longo tomentoso; lamina late ovalis vel rotundato-ovata, interdum fere orbicularis, 2–4.5 cm. longa 1.5–2.5 cm. lata, apice obtusa vel late obtusa, interdum subacuta, mucronato-apiculata, basi late rotundata vel interdum subcordata, supra opaca laxe sparse albido-tomentosa, costa nervisque obscuris, subtus grisea tomento subdenso laxo araneoso induta, costa gracili elevata, nervis lateralibus utroque latere ca. 6 angulo lato adscendentibus teneris prominulis subarcuatis, venis tomento occultis; inflorescentia thyrsiformi-paniculata, interdum fere racemosa, breviter pedunculata, 7–11 cm. longa ad 5 cm. basi lata, rhachi crassa densissime puberulo-tomentosa, floribus plerumque in cymas paucifloras dispositis, interdum racemosis, bracteis parvis lanceolato-oblongis deciduis, pedicellis crassis plerumque brevibus interdum ad 7 mm. longis dense puberulo-tomentulosis; calycis tubus 5–6 mm. longus clavatus in sicco striatus dense ut sepala puberulo-tomentulosus; sepala ovalia vel oblongo-ovalia 4.5 mm. longa obtusa intus dense sericea; stamina ca. 30, filamentis glabris; fructus juvenilis ovalis ca. 9 mm. longus araneoso-tomentosus apice rotundatus.—Brazil: Campo Major, State of Piauhy, in 1935, *B. E. Dahlgren 986* (type in Herb. Field Mus.).

Related to *C. Martiana* Hook. f., which has a shorter inflorescence and relative narrow and elongate leaves.

Couepia habrantha Standl., sp. nov.—Arbor 7.5 m. alta, ramulis crassiusculis, novellis subangulatis ochraceis araneoso-tomentosis vel glabratis, internodiis brevibus; folia inter minora breviter petiolata rigide coriacea, petiolo crasso ca. 7 mm. longo tomentoso; lamina oblonga 6–10 cm. longa 2.5–3.8 cm. lata abrupte breviter obtuso-acuminata, basi acuta, supra in sicco brunnescens lucida primo laxe tomentosa sed cito glabrata, costa prominula, nervis obscuris subimpressis, subtus rufescens tomento laxo adpresso araneoso ubique induta vel serius glabrata, costa gracili elevata, nervis lateralibus utroque latere ca. 17 angulo latiusculo divergentibus teneris prominulis, venulis obsoletis; inflorescentia spicata terminalis densissime multiflora 3–4.5 cm. longa subsessilis, rhachi crassa dense breviter velutino-pilosa, floribus arcte sessilibus, bracteis ovatis vel oblongis fere ad 1 cm. longis dense sericeis; calycis tubus 8 mm. longus oblongo-turbinatus extus dense subadpresse sericeo-pilosulus, sepalis late ovatis obtusis 4 mm. longis intus glabris; petala sepalis paullo longiora praeter apicem pilosulum glabra; stamina numerosa ca. 1 cm. longe exserta, filamentis glabris; ovarium ut stylus basi villosum.—Brazil: State of Amazonas, Humayta, between Monte Christo and Santa Victoria on Rio Ipixuna, margin of river, November, 1934, *B. A. Krukoff 7252* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Well marked by the short and very dense inflorescence, with large but deciduous bracts.

Couepia Krukovii Standl., sp. nov.—Arbor 6–15-metralis, ramulis crassis subteretibus rimosis ferrugineo-ochraceis vel fuscis, internodiis brevibus, densissime pilis brevissimis adpressis vel adscendentibus fulvis pilosis; stipulae persistentes paullo ultra 1.5 cm. longae lineari-attenuatae adpresso-pilosulae; folia inter maxima brevissime petiolata subcoriacea, petiolo crasso 3–6 mm. longo dense adpresse tomentuloso; lamina anguste oblonga 22–33 cm. longa 5–8 cm. lata apice rotundata et abrupte breviter apiculato-acuminata vel angustata atque acuminata, basi anguste rotundata, supra in sicco vix lucida, in juventute ut videtur laxe araneoso-tomentosa sed cito glabrata, costa prominente, nervis venulisque vix prominulis, subtus fere concolor primo arcte pilis longis laxis pallidis araneoso-tomentosa sed cito glabrata vel fere omnino glabra, costa gracili elevata, nervis lateralibus utroque latere 19–23 angulo lato adscendentibus prominentibus teneris fere rectis prope marginem arcuato-conjunctis, venulis prominulis laxe reticulatis; inflorescentia terminalis vel lateralis spicata dense pauciflora sessilis, rhachi ad 2.5 cm. longa angulata dense breviter subpatenti-pilosa, floribus arcte sessilibus magnis, bracteis ca. 8 mm. longis adpressis persistentibus late ovatis acutis vel acuminatis extus dense sericeis carinatis; calycis tubus cylindraceus 2.5 cm. longus 4 mm. crassus subcurvus extus sicut sepala densissime pilis brevibus fulvis subpatentibus vel adpressis pilosulo-tomentosus, sepalis rotundato-ovatis vel late ovalibus fere 1 cm. longis obtusis patentibus intus dense minute sericeis; stamina numerosissima glabra fere 3 cm. longa; stylus basin versus dense longivillosus.—Brazil: State of Amazonas, Humayta, near Tres Casas, on restinga alta, September 22, 1934, *B. A. Krukoff 6208* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard). Manicore, near Bella Vista, September, 1934, *Krukoff 6007.*

The very large, long and narrow leaves are distinctly unlike those of any other Brazilian species.

Couepia latifolia Standl., sp. nov.—Arbor 15-metralis, ramulis gracilibus longitrorsum rugosis ferrugineis glabratis; folia magna brevissime petiolata tenuia vix coriacea, petiolo crasso ad 1 cm. longo glabrato; lamina ovalis vel oblongo-ovalis 17–24 cm. longa 7.5–12 cm. lata, apice rotundata vel obtusa et breviter obtuse apiculato-acuminata, basi obtusa vel late rotundata, supra in sicco lucida cinereoviridis glabra, costa prominente, nervis subimpressis, venis vix prominulis, subtus paullo pallidior sub oculo ut videtur glabra sed vere tomento fere microscopico arcte adpresso pallido plus minusve induta, costa gracili elevata, nervis lateralibus utroque latere ca. 17 angulo lato divergentibus gracilibus prominentibus subarcuatis juxta marginem arcuato-conjunctis, venulis prominulis laxe reticulatis; inflorescentia non visa; calycis tubus 1.5 cm. longus lineari-clavatus extus densissime adpresse cinnamomeo-tomentulosus interdum valde curvus, sepalis oblongis recurvis ca. 1 cm. longis extus densissime tomentosis obtusis; petala sepalis subaequilonga glabra; stamina perplurima glabra; fructus oblongus teres glaber vel glabratus 3–4.5 cm. longus 1–1.5 cm. diam. apice anguste rotundatus.—Brazil: State of Amazonas, Manicore, near Bella Vista, restinga alta, September, 1934, *B. A. Krukoff 6005* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Hirtella Duckei Huber, Bol. Mus. Goeldi 6: 74. 1910.—The following recent Brazilian collections have been seen: Amazonas, Paranagua, Municipality Teffe, on terra firma, a tree of 6 meters, *Krukoff 4557.* Amazonas, Humayta, near Livramento, on terra firma, a tree of 6 meters, *Krukoff 6834.*

Hirtella egensis Fritsch, Ann. Hofmus. Wien 5: 10. 1890.—A single recent collection agrees exactly with the original material, which was collected at Ega: Mata do Cachoeira, Maracassumé

River region, Maranhão, a tree of 13 meters, the trunk 18 cm. in diameter, *R. Froes 1899.*

Hirtella physophora Mart. & Zucc. Abh. Akad. Muenchen 10: 374. 1832.—The type was collected by Spruce at Barra. The following Brazilian collections are conspecific: Amazonas, Humayta, near Livramento, on terra firma, a tree of 6 meters, *Krukoff 6874.* Amazonas, São Paulo de Olivença, on high land, a shrub of 4.5 meters, the trunk 5 cm. in diameter, the flowers white, *Krukoff 8190.*

Hirtella purusana Huber, Bol. Mus. Goeldi 6: 72. 1910.—A single recent Brazilian collection of this well marked species has been examined: Amazonas, Humayta, near Livramento, on terra firma, a shrub of 5.5 meters, *Krukoff 6983.*

Hirtella racemosa Lam. var. **oblongifolia** (DC.) Standl., comb. nov. *H. oblongifolia* DC. Prodr. 2: 529. 1825. *H. americana* var. *oblongifolia* Benth. in Mart. Fl. Bras. 14, pt. 2: 34. 1867.—This variety seems to be common in the upper Amazon Valley. In general appearance, particularly in leaf form, it is so unlike the more widespread forms of *H. racemosa* that it may perhaps deserve the specific rank given it by De Candolle.

Hirtella rasa Standl., sp. nov.—Arbor 6–27-metralis, ramulis gracilibus teretibus ferrugineis pallido-lenticellatis primo sparsissime pilis parvis subadpressis pallidis pilosulis cito glabratis, internodiis brevibus vel paullo elongatis; folia modica vel majuscula breviter petiolata subcoriacea, petiolo crassiusculo 5–7 mm. longo strigilloso; lamina elliptico-oblonga vel oblonga, rare ovali-elliptica 11–13 cm. longa 4–6.5 cm. lata acuta vel breviter acuminata, apice ipso obtuso, basi acuta ad rotundata et saepe subito breviter contracta, supra in sicco lucida tactu asperula, ad venas sparse minute hispidula vel fere omnino glabra, costa ut nervis prominula, venulis prominulis arcte reticulatis, subtus vix pallidior asperula sparse minute strigilloso-scaberula vel fere glabra, costa gracili elevata, nervis lateralibus utroque latere ca. 9 angulo latiusculo adscendentibus teneris arcuatis, venulis vix prominulis arcte reticulatis; inflorescentia terminalis corymboso-paniculata 8–19 cm. longa et fere aequilata sessilis vel breviter pedunculata solemniter ramosa laxe multiflora, ramis valde adscendentibus rigidis pilis minutis adscendentibus vel adpressis cinereis vel fulvis dense pilosulis, bracteis bracteolisque parvis late ovatis obtusis deciduis eglandulosis, floribus sessilibus vel breviter pedicellatis; calyx densissime minute fulvo- vel cinereo-sericeus, tubo turbinato fere 3 mm. longo basi acuto, sepalis rotundo-ovalibus

aequilongis apice late rotundatis reflexis; petala lata alba glabra apice rotundata fere 4 mm. longa; stamina 5, filamentis purpureis glabris elongatis; ovarium densissime patenti-pilosum.—Peru: On river bank, Juanjuí, Dept. San Martín, Alto Río Huallaga, 400–800 meters, February, 1936, *G. Klug 4249* (type in Herb. Field Mus.).—Brazil: Territory of Acre, near mouth of Rio Macauhan, a tributary of Rio Yaco, on terra firma, August, 1933, *B. A. Krukoff 5525.*

In Hooker's account of this genus in the *Flora Brasiliensis*, the present plant runs in the key at once to *H. scabra* Benth., a species of the Guianas and the upper Amazon. That differs conspicuously in having leaves only half as large, as well as in numerous minor details.

Hirtella Sprucei Benth. in Mart. Fl. Bras. 14, pt. 2: 30. 1867. —One recent Brazilian collection of this apparently rare species has been seen: Amazonas, near mouth of Rio Embira, on terra firma, a tree of 9 meters, *Krukoff 4684.*

Licania anisophylla Standl., sp. nov.—Arbor 22-metralis, trunco 23 cm. diam., ut videtur dense ramosa, ramulis crassiusculis teretibus rimosis cinnamomeis, novellis dense adpresse minute fulvo-tomentulosis, internodiis brevibus; folia modica breviter petiolata rigide coriacea, petiolo crasso 4–6 mm. longo primo dense minute tomentuloso; lamina forma insigniter variabilis elliptico-oblonga ad elliptica vel elliptico-rotundata 4.5–10 cm. longa 3–7 cm. lata apice obtusa atque abrupte breviter obtuso-acuminata vel subcaudato-acuminata, interdum rotundata et apiculato-acuminata, basi obtusa vel acutiuscula, interdum rotundata, supra lucida glabra, costa venisque manifestis sed non elevatis, venis obsoletis, subtus brunnescens, ubique tomento adpresso lanato subferruginoso obtecta, costa crassiuscula elevata, nervis lateralibus utroque latere 5–6 prominentibus arcuatis prope marginem obscure conjunctis angulo semirecto adscendentibus, venulis prominulis sed tomento fere occultis arcte reticulatis; inflorescentia paniculata foliis longior, ramis rigidis angulo ca. semirecto adscendentibus crassis densissime minute ferrugineo-tomentosis, floribus arcte sessilibus solitariis vel secus ramos remote aggregatis, bracteis minutis vix ad 1 mm. longis late ovatis persistentibus; calyx fructifer vix ultra 2 mm. longus minute fulvo-adpresso-pilosulus, tubo intus non araneoso, lobis tubo brevioribus rotundato-ovatis obtusis intus minute sericeis; fructus juvenis clavato-oblongus ca. 8 mm. longus apice rotundatus subdense minute adpresso-pilosulus.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, low land, September–October,

1936, *B. A. Krukoff 8451* (type in herb. N. Y. Bot. Gard.; photo. in Herb. Field Mus.).

Related to *L. micrantha* Miq., which also occurs in the Amazon Valley, but differing obviously in the shape, venation, and indument of the leaves.

Licania aspera Standl., sp. nov.—Arbor 15-metralis, trunco 20 cm. diam., ramulis crassiusculis teretibus primo densissime pilis brevibus patentibus vel adscendentibus fulvis pilosis, internodiis brevibus; folia majuscula breviter petiolata tenuiter coriacea, petiolo crasso vix ad 7 mm. longo dense pilosulo-tomentoso; lamina oblonga vel elliptico-oblonga ca. 20 cm. longa atque 8.5 cm. lata acuta vel breviter acuminata, basi rotundata vel subtruncata, interdum subcordata, supra in sicco grisea sublucida ubique dense pustulato-punctata, tactu asperrima, costa elevata, nervis venisque manifestis sed vix prominulis, subtus albida tomento adpresso araneoso dense induta, costa gracili elevata, nervis lateralibus utroque latere ca. 10 angulo semirecto adscendentibus teneris fere rectis prominentbus prope marginem irregulariter arcuato-conjunctis, venulis insigniter prominentibus arcte reticulatis; paniculae axillares et terminales foliis breviores laxe pauciramosae sessiles, ramis patentibus gracilibus densissime pilis patentibus brevibus fulvis pilosis, floribus secus ramos solitariis vel subaggregatis sessilibus, bracteis patentibus oblongo-lanceolatis acuminatis ad 3 mm. longis persistentibus extus pilosulis intus ferrugineis glabris; calyx subcampanulatus 2 mm. longus extus densissime patenti-pilosulus, lobis tubo paullo longioribus late ovatis obtusis intus breviter pilosis; antherae exsertae.—Brazil: State of Pará, Cajutuba, Tapajos region, on high land, January 18, 1932, *R. C. Monteiro da Costa 279* (type in Herb. Field Mus.).

Vernacular name Pajurá-rana. Easily recognized by the pustulate-scabrous upper surface of the leaves.

Licania celativenia Standl., sp. nov.—Arbor 6–33-metralis, ramulis crassis ferrugineis vel fuscis teretibus rimosis glabris, internodiis brevibus; folia modica petiolata rigide coriacea, petiolo crasso 1–2 cm. longo glabro; lamina obovato-oblonga 6–11.5 cm. longa 3.5–6 cm. lata, apice late rotundata et vulgo leviter emarginata, basin acutam versus paullo angustata, supra in sicco lucida glabra, costa nervisque manifestis sed non elevatis, venis obsoletis, subtus brunnescens glabra vel primo sparse minutissime puberula, sublucida, costa crassiuscula prominente, nervis lateralibus utroque

latere ca. 9 angulo semirecto adscendentibus teneris prominulis subarcuatis vel fere rectis prope marginem irregulariter arcuato-conjunctis, venis obsoletis; inflorescentia fructifera paniculata fere corymbiformis laxe multiflora foliis longior, ramis crassis ferrugineis subangulatis sparse breviter patenti-pilosis, floribus sessilibus; fructus subglobosus (immaturus) et ca. 2 cm. longus, apice rotundatus dense puberulo-tomentulosus et sparse hirsutus, vel interdum 3 cm. longus 1.5 cm. latus oblongo-ovoideus et apice acutatus.—Brazil: State of Amazonas, Humayta, on plateau between Rio Livramento and Rio Ipixuna, on campinarana, November, 1934, *B. A. Krukoff 7182* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.). Also *No. 7120* from the same region.

The species is well marked by the general lack of pubescence on the vegetative parts, and by the suppressed veins of the leaves. The two collections cited exhibit slight differences, particularly in the form of the fruit, but they probably represent a single species.

Licania Dahlgrenii Standl., sp. nov.—Ramuli graciles teretes ferruginei dense lenticellati, novellis laxe araneoso-tomentosis, glabrescentibus, internodiis brevibus; stipulae lineares ad 8 mm. longae ferrugineae; folia parva breviter petiolata tenuiter coriacea, petiolo crasso vix ad 4 mm. longo laxe tomentoso; lamina oblonga vel ovato-oblonga, interdum ovata, 5–8.5 cm. longa 2–4.5 cm. lata obtusa, basi inaequaliter obtusa vel subrotundata, supra in sicco lucida glabra, costa ut nervis venisque prominula vel prominente, subtus fere concolor, primo laxe araneoso-tomentosa cito glabrata, costa gracili elevata, nervis lateralibus utroque latere ca. 9 teneris angulo latiusculo adscendentibus arcuatis prope marginem irregulariter arcuato-cinjunctis, venulis prominentibus subarcte reticulatis; paniculae terminales et axillares sessiles laxe multiflorae magnae usque 18 cm. longae, ramis gracilibus subpatentibus densiuscule griseo-tomentulosis, floribus sessilibus plerumque in fasciculos trifloros brevissime pedunculatos dispositis, fasciculis secus ramos remote insertis, bracteis minutis minus quam 1 mm. longis triangularibus intus glabris; calyx 2.5 mm. longus extus intusque griseo-tomentulosus, lobis ovatis obtusis tubo paullo longioribus; stamina 10 calyce plus quam duplo longiora, filamentis glabris.—Brazil: State of Piauhy, Pedro Segundo, in 1935, *B. E. Dahlgren 876* (type in Herb. Field Mus.).

Licania elliptica Standl., sp. nov.—Arbor 23-metralis, ramulis gracilibus teretibus ochraceis vel subferrugineis rimosis et lenticellis magnis pallidis notatis, novellis glabris, internodiis brevibus; folia modica vel majuscula brevissime petiolata coriacea, petiolo crassiusculo ca. 5 mm. longo glabro; lamina elliptica vel oblongo-elliptica 12–14.5 cm. longa 6–8 cm. lata, apice obtusa et abrupte acuminata vel cuspidato-acuminata, interdum apice late rotundata et apicata, basi acuta, supra in sicco sublucida glabra, costa nervisque prominulis, venulis manifestis sed vix prominulis, subtus juventute glauca et minutissime dense albo-tomentulosa, serius glabrata, costa gracili prominente, nervis lateralibus utroque latere ca. 8 angulo latiusculo adscendentibus prominentibus arcuatis marginem fere attingentibus, venulis inconspicuis laxe reticulatis; inflorescentiae axillares et terminales paniculatae laxe multiflorae foliis longiores vel breviores, ramis gracilibus viridibus glabris vel sparse puberulis, floribus sessilibus solitariis vel remote aggregatis, bracteis minutissimis; alabastra globoso-obovoidea apice rotundata extus minute fulvo-tomentulosa; calyx 2 mm. longus, lobis tubo multo brevioribus obtusis intus tomentellis; petala nulla; stamina vulgo 3.—Brazil: State of Amazonas, near mouth of Rio Embira, a tributary of Rio Tarauaca, June 27, 1933, on varzea land, *B. A. Krukoff 5014* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Licania Krukovii Standl., sp. nov.—Arbor 15-metralis, ramulis crassis teretibus densissime pilis patentibus vel adscendentibus fulvis vel brunneis pilosis vel subtomentosis, internodiis brevibus; stipulae persistentes petiolo adnatae late ovatae acutae ad 1 cm. longae extus dense fulvo-pilosae; folia majuscula breviter petiolata subcoriacea, petiolo crasso vix ad 7 mm. longo dense piloso-tomentoso; lamina oblonga vel lanceolato-oblonga 14–21 cm. longa 5–10 cm. lata vulgo longiacuminata, basi subrotundata ad acutiuscula, supra in sicco fusco-brunnescens sublucida, primo sat dense fulvo-hispidula, cito glabrata, costa gracili prominente, nervis manifestis subimpressis, venulis obscuris vel interdum subimpressis, subtus pallidior ubique dense molliter fulvo-hispidula, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 13 elevatis gracilibus angulo latiusculo adscendentibus juxta marginem arcuato-conjunctis, venulis prominulis laxe reticulatis; paniculae terminales et axillares laxe pauciramosae foliis breviores, ramis crassis densissime brunneo-piloso-tomentosis, bracteis extus dense fulvo-pilosulis lanceolatis vel fere subulatis, infimis ad 2 mm. longis, floribus arcte sessilibus secus rhachin remote aggregatis; calyx ca. 2 mm. longus extus intusque dense breviter velutino-pilosulus, lobis tubo multo

brevioribus late ovatis acutiusculis; petala 5 minuta; stamina ca. 5. —Brazil: State of Amazonas, near mouth of Rio Embira, a tributary of Rio Tarauaca, on terra firma, June 28, 1933, *B. A. Krukoff 5070* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

Closely related to *L. intrapetiolaris* Spruce, which has glabrous leaves and branches. Also related are *L. latifolia* Benth. and *L. obovata* Benth., in both of which species the leaves are rounded at the apex.

Licania oblongifolia Standl., sp. nov.—Arbor 16–33-metralis, trunco 30 cm. et ultra diam., ramulis crassis subteretibus plus minusve ferrugineis rimosis et lenticellis numerosis parvis pallidis conspersis glabris, internodiis brevibus; stipulae petiolo adnatae, parte libera filiformi 5 mm. longa; folia mediocria breviter petiolata tenuiter coriacea, petiolo glabro crasso usque 1 cm. longo supra canaliculato; lamina in sicco interdum complicata anguste oblonga vel interdum lineari-oblonga 11–14 cm. longa 2.5–5 cm. lata acuta vel breviter obtuso-acuminata, basin versus vix angustata, basi rotundata vel obtusissima, glabra, supra in sicco brunneo-fuscescens sublucida, costa prominente, nervis prominulis, venis manifestis sed vix elevatis, subtus concolor, costa gracili elevata, nervis lateralibus utroque latere ca. 11 angulo latiusculo adscendentibus prominulis teneris prope marginem irregulariter arcuato-conjunctis, venulis prominulis laxiuscule reticulatis; inflorescentia (in statu fructifero tantum visa) ut videtur parva et pauciflora, ramis glabris vel glabratis crassis; fructus maturus fere sessilis ovoideo-globosus 5.5 cm. longus 4.5 cm. latus, basi et apice rotundatus, ferrugineus, ubique in sicco grosse reticulato-rugosus glabratus.—Brazil: State of Amazonas, Humayta, near Livramento, on Rio Livramento, on terra firma, October–November, 1934, *B. A. Krukoff 6812* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.). Humayta, on plateau between Rio Livramento and Rio Ipixuna, in cipoal, November, 1934, *Krukoff 7216.* State of Matto Grosso, near Tabajaza, upper Machado River region, on varzea land, November–December, 1931, *Krukoff 1452.*

Vernacular name Castanha (Matto Grosso). Marked by the narrowly oblong leaves with parallel sides, similar to those of *L. macrophylla* Benth. but much smaller.

Licania pallida Britton, Bull. Torrey Club 17: 9. 1890. *L. Britteniana* Fritsch, Oesterr. Bot. Zeitschr. 42: 6. 1892. *Moquilea elata* Pilger, Notizbl. Bot. Gart. Berlin 6: 136. 1914.

Licania pallida was renamed unnecessarily by Fritsch, there being no older valid homonym. *L. pallida* Spruce was published by Hooker f. merely in synonymy in the *Flora Brasiliensis.* There is also an *L. pallida* (Hook. f.) Kuntze, published in 1891, based upon *Moquilea pallida* Hook. f., and later renamed *Licania Hookeri* by Fritsch. In renaming Britton's species, Fritsch evidently misunderstood the name of its author. Apparently synonymous with *L. pallida* Britton is *Moquilea elata* Pilger, as indicated by a photograph of the Berlin type and material identified with it at Berlin by Macbride. The following material of this species has been examined by the writer.

Bolivia: Junction of rivers Bení and Madre de Dios, *Rusby 2442,* type collection of *L. pallida* Britton.—Peru: Puerto Arturo, Dept. Loreto, 200 meters, *Williams 5064.*—Brazil: Alto Acre, Seringal São Francisco, *Ule 9446* (type of *M. elata;* photo. in Herb. Field Mus.). Amazonas, São Paulo de Olivença, near Palmares, on high land, a tree of 27 meters, the trunk 25 cm. in diameter, *Krukoff 8507;* in low land, high forest, a tree of 21 meters, the trunk 20 cm. in diameter, *Krukoff 8445.* Amazonas, Humayta, near Tres Casas, on varzea land, a tree of 50 meters, *Krukoff 6139;* on restinga alta, a tree of 36 meters, local name "pajurá," *Krukoff 6306.* Territory of Acre, near mouth of Rio Macauhan, on terra firma, a tree of 40 meters, *Krukoff 5635.* Amazonas, near mouth of Rio Embira, on varzea land, a tree 23 meters high with white flowers, *Krukoff 5165.*

Licania riparia (Gleason) Standl., comb. nov. *Moquilea riparia* Gleason, Bull. Torrey Club 61: 192. 1934.

Licania stenocarpa Standl., sp. nov.—Arbor 16-metralis, trunco 15 cm. diameter, ut videtur dense ramosa, ramulis gracilibus teretibus ferrugineis vel fuscis rimosis, novellis sat dense tomentulosis, internodiis brevibus; stipulae breviter petiolo adnatae filiformes usque 7 mm. longae; folia parva breviter petiolata tenuiter coriacea, petiolo crassiusculo 6–8 mm. longo tomentuloso; lamina oblongo-elliptica 6.5–8.5 cm. longa 3–4.3 cm. lata abrupte anguste obtuso-acuminata, basi obtusa, supra in sicco lucida glabra, costa elevata, nervis planis vel prominulis, venis manifestis sed vix elevatis, subtus paullo pallidior tomento minuto adpresso subfulvo dense induta, costa gracili elevata, nervis lateralibus utroque latere ca. 8 angulo latiusculo adscendentibus arcuatis teneris prominentibus prope marginem irregulariter arcuato-conjunctis, venulis prominulis crassiusculis arctissime reticulatis; paniculae (in statu fructifero tantum visae)

parvae foliis vulgo breviores pauciramosae, ramis gracilibus tomentulosis et pilosulis remotifloris, floribus sessilibus, bracteis persistentibus interdum reflexis triangularibus ca. 1 mm. longis acutis; calyx sub fructum persistens ca. 2 mm. longus extus dense minute adpresso-tomentulosus, fauce longipilosus, lobis brevissimis obtusis; fructus immaturus anguste oblongus teres 14 mm. longus 4 mm. latus sessilis apice anguste rotundatus glaber.—Brazil: State of Amazonas, São Paulo de Olivença, near Palmares, terra firma, high land, September–October, 1936, *B. A. Krukoff 8553* (type in herb. N. Y. Bot. Gard.; fragment in Herb. Field Mus.).

Related, perhaps, to *L. emarginata* Spruce, whose leaves are glabrous and not or scarcely acuminate.

Parinarium pilosum Standl., sp. nov.—Arbor 33-metralis, ramulis crassiusculis fuscis vel ferrugineis rimosis, novellis dense pilis patentibus vel adscendentibus rigidulis brunnescentibus vel fulvis pilosis, internodiis brevibus vel subelongatis; stipulae ferrugineae lineares ad 1.5 cm. longae adpresso-pilosae persistentes; folia modica breviter petiolata rigide coriacea, petiolo crasso 6–10 mm. longo, dense patenti-piloso; lamina oblongo-elliptica, oblonga vel ovali-elliptica 8.5–14 cm. longa 3.5–7.5 cm. lata, apice obtusa vel rotundata, interdum subemarginata, rare breviter acuminato-apicata, basi rotundata vel obtusa, marginibus plus minusve recurvis, supra lucida ad costam prominulam fulvo-hispidula, aliter glabra, nervis subimpressis, venis fere obsoletis, subtus ubique sparse molliter pilis longiusculis fulvis patentibus pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 12 elevatis angulo latiusculo adscendentibus arcuatis marginem fere attingentibus, venulis solemniter elevatis et arctissime reticulatis; inflorescentia non visa; fructus ovoideo-globosus ca. 6 cm. longus et aequilatus basi et apice rotundatus ubique tomento fulvo subvelutino densissime obtectus.—Brazil: State of Amazonas, Humayta, on plateau between Rio Livramento and Rio Ipixuna, on campinarana alta, November, 1934, *B. A. Krukoff 7109* (type in Herb. Field Mus.; duplicate in herb. N. Y. Bot. Gard.).

It is unsatisfactory to have no flowering material for preparation of a description, but the tree is clearly unlike any species known from Brazil, as indicated by the shape and indument of the leaves.

Potentilla exsul Standl., sp. nov.—Perennis humilis, rhizomate crasso apice basibus foliorum vetustorum dense obtecto; folia basalia pauca 5-foliolata vel rare 3-foliolata, petiolo 2.5–5.5 cm.

longo gracili pilis longis albis patentibus vel adscendentibus dense piloso; foliola inaequalia, infima minora, cuneato-oblonga 2–3.5 cm. longa 7–12 mm. lata, basin versus cuneato-angustata, apice late rotundata, supra basin grosse crenata, crenaturis utroque latere 6 vel paucioribus, supra viridia sparse pilis rigidulis longis strigosa, subtus dense longisericea atque albo-tomentosa; scapus vix folia aequans ca. 4-florus gracilis longipilosus, versus basin bracteatus, pedicellis gracilibus longipilosis usque 1.5 cm. longis; calyx extus dense pilis longis albis subadpressis indutus, sepalis lanceolato-oblongis 5–6 mm. longis acuminatis vel attenuato-acutis, bracteolis lanceolato-oblongis sepala fere aequantibus; petala ut videtur pallide lutea late obovata apice subtruncata glabra ca. 1 cm. longa. —Mexico: Along mountain stream, near Mesa de Correo, Chihuahua, July 2, 1936, *Harde LeSueur 663* (type in Herb. Field Mus.).

Potentilla Mexiae Standl., sp. nov.—Herba perennis plus minusve caespitosa e radice longissima crassa sublignea nascens, humilis, basibus foliorum vetustorum longe persistentibus; folia basalia numerosa congesta parva, petiolis usque 2.5 cm. longis gracilibus pilis longis adscendentibus albidis dense pilosis; foliola 5 oblongo-obovata vel cuneato-obovata 6–15 mm. longa 4–6 mm. lata apice obtusa vel rotundata, basin versus plus minusve cuneato-angustata, crenata, crenaturis utroque latere 3–4 ovatis obtusis, supra griseo-viridia dense albido-strigosa, subtus fere concoloria densius pilis longis strigosa et tomentosa; caules numerosi erecti vel decumbentes vix ultra 7 cm. alti graciles dense pilis longis albis adscendentibus pilosi, prope basin vulgo 1-foliati, bracteis superioribus valde reductis et trifoliolatis, floribus paucis vulgo 3–5 cymam parvam laxam efformantibus breviter pedicellatis; calyx extus dense griseo-strigosus, sepalis 5 mm. longis ovato-oblongis acutis, bracteolis oblongis obtusis sepalis paullo brevioribus; petala lutea sepalis paullo longiora glabra apice subtruncata vel emarginata; achaenia pauca laevia viridia ca. 1.3 mm. longa.—Mexico: Southwest of Basuchil, District of Guerrero, Chihuahua, on dry, gravelly plateau, forming small mats, May 18, 1929, *Ynes Mexia 2542* (type in Herb. Field Mus.). Majalca, Chihuahua, June 24, 1936, *Harde LeSueur 655*.

Potentilla leonina Standl., sp. nov.—Perennis humilis caespitosa, radice apice incrassata atque basibus foliorum vetustorum dense obtecta plus minusve lignosa; folia basalia numerosa 5-foliolata, petiolis usque 2.5 cm. longis dense pilis longissimis albis patentibus vel adscendentibus pilosis; foliola cuneato-oblonga plerumque

1.5–3 cm. longa atque 5–9 mm. lata, apice obtusa vel rotundata, basin versus cuneato-angustata, crenata, crenaturis utroque latere 4–5 obtusis subadpressis, supra viridescentia subdense pilis longis piloso-strigosa, subtus alba sat dense piloso-strigosa et densissime tomentosa; caules pauci usque 11 cm. longi erecti vel decumbentes pilis longis albis laxis adscendentibus pilosi infra medium 1–2-foliati, bracteis inflorescentiae vulgo 3-foliolatis et valde reductis, floribus paucis laxe cymosis, pedicellis gracilibus usque 1.5 cm. longis; calyx extus dense pilis longis albis subadpressis pilosus, sepalis 7 mm. longis attenuato-acutis ovato-oblongis, bracteolis lanceolato-oblongis obtusis sepalis fere aequilongis; petala fere obreniformia pallide lutea ca. 1 cm. longa et aequilata profunde emarginata; achaenia viridia laevia.—Mexico: Abundant in alpine meadows above timber line, peak of Cerro Potosí, Municipio de Galeana, Nuevo León, July 21, 1935, *C. H. Mueller 2242* (type in Herb. Field Mus.).

Evidently this plant is closely related to *P. Mexiae*, but it differs conspicuously enough in being substantially larger in all its parts, particularly the flowers.

LEGUMINOSAE

Calliandra Gentryi Standl., sp. nov.—Frutex 3–5-metralis, ramis gracilibus subteretibus dense pilis brevibus patenti-pilosis, internodiis elongatis; stipulae 5 mm. longae persistentes dense pilosae; folia majuscula longipetiolata, rhachi 2–4 cm. longa, pinnis 2–3-jugis 3.5–5.5 cm. longis; foliola plerumque 5-juga late obliquo-ovalia vel late obovato-ovalia 1–2 cm. longa 6–12 mm. lata membranacea, apice late rotundata vel truncata et brevissime apiculata, basi valde obliqua late rotundata vel truncata et obscure trinervia, supra viridia sparse adpresso-pilosula, nervis venisque obscuris, subtus pallidiora dense pilis brevibus subadpresses rectis vel incurvis pilosa; capitula axillaria vel racemum brevem terminale efformantia staminibus exclusis ca. 1.5 cm. diam. globosa dense multiflora, pedunculo gracili 2–5 cm. longo dense patenti-piloso basi bracteato, bracteis oblongis viridibus ca. 5 mm. longis; bracteis capitulorum oblongis viridibus glabris; calyx glaber 4 mm. longus fere ad basin lobatus, lobis viridibus oblongis acutiusculis; corolla 6 mm. longa glabra profunde lobata, lobis apice viridibus; stamina alba 3 cm. longa.—Mexico: Guasaremos, Río Mayo, Chihuahua, in canyon, August 5, 1936, *Howard Scott Gentry 2363* (type in Herb. Field Mus.); a tall, slender shrub; flowers white, wilting with warmth.

Huisiego, Río Mayo, Chihuahua, in canyon, riparian, August 15, 1936, *Gentry 2389;* stamens greenish white, erect in the early morning.

Vernacular name Clavellino. Referable, apparently, to Britton and Rose's group *Formosae.*

Desmodium Gentryi Standl., sp. nov.—Herbacea, caule gracillimo subtereti glabro vel glabrato, internodiis brevibus vel elongatis; stipulae deciduae ca. 1 cm. longae brunneae striatae ciliatae lineari-lanceolatae longe anguste attenuatae; folia majuscula 3–4 cm. longe petiolata, petiolo gracili striato glabro, rhachi 8–13 mm. longa glabra, stipellis linearibus ad 8 mm. longis, petiolulis vix ad 2 mm. longis pilosulis; foliola 3 anguste lanceolato-oblonga vel oblonga, rare elliptico-oblonga, plerumque 6–12 cm. longa atque 1.5–2.5 cm. lata, longe anguste attenuata, rarius acuta vel obtusa, basi late rotundata, membranacea, supra in sicco laete viridia glabra vel glabrata, venis prominulis laxe reticulata, subtus paullo pallidiora, ad nervos sparse adpresso-pilosa vel glabra, costa nervisque prominentibus gracillimis; flores racemosi, racemis 26 cm. longis et ultra remote paucifloris, bracteis caducis lineari-lanceolatis ca. 5 mm. longis, rhachi gracili dense breviter uncinulato-pilosula, pedicellis ad 4 mm. longis viscido-uncinulato-pilosulis; calyx pallide viridis ca. 3 mm. longus fere glaber, lobis valde inaequalibus lanceolato-triangularibus acuminatis; corolla 7 mm. longa glabra; legumen 2–2.5 cm. longum 3 mm. latum, brevissime stipitatum, utroque margine sed superiore brevius rotundato-lobatum, articulis ca. 6 densissime viscido-uncinulato-hispidulis.—Mexico: Arroyo Hondo, Sierra Charuco, Chihuahua, in pine flats, September 11, 1935, *Howard Scott Gentry 1749* (type in Herb. Field Mus.).

"Flowers yellowish white, with two green spots on the upper lip."

Desmodium lavanduliflorum Standl., sp. nov.—Herba procumbens, caule gracili elongato subtereti densissime pilis brevibus uncinulatis viscidis piloso, internodiis elongatis; stipulae virides membranaceae persistentes 12–15 mm. longae e basi late ovato-cordatae abrupte longicaudatae dense pilis longis laxis pilosae; folia longipetiolata, petiolo dense piloso, rhachi 1 cm. longa vel paullo ultra, stipellis linearibus ca. 5 mm. longis, petiolulis ad 2 mm. longis dense longipilosis; foliola 3 orbicularia vel rotundato-ovalia 2.5–4.5 cm. lata, apice late rotundata mucronata, basi late rotundata vel subtruncata, membranacea, supra in sicco viridia dense bulboso-punctata dense pilis longis laxis pilosa, subtus paullo pallidiora similiter sed densius pilosa; flores racemosi, racemis simplicibus remote laxe pauc- vel multiflori longipedunculati usque 28 cm. longi, rhachi dense glanduloso-pilosa, pedicellis fructiferis plerumque 1.5–2 cm. longis gracillimis patentibus vel adscendentibus, bracteis caducis non visis; calyx ca. 4 mm. longus purpureo tinctus sparse pilosulus vel glabratus, lobis valde inaequalibus acutis vel acuminatis; corolla ca. 8 mm. longa, petalis glabris; legumen vix ultra 1 mm. longe stipitatum 2.5–3.5 cm. longum 4 mm. latum utroque margine, superiore paullo brevius, crenato-lobatum, articulis 5–6 oblique rotundato-ovalibus densissime viscido-uncinato-pilosulis, stylo fere 5 mm. longo.—Mexico: Quicorichi, Río Mayo, Chihuahua, in pine forest, October 7, 1935, *Howard Scott Gentry 1963* (type in Herb. Field Mus.).

"Procumbent; flowers lavender."

Desmodium quercetorum Standl., sp. nov.—Herba ut videtur erecta 60 cm. alta et ultra, caulibus gracilibus teretibus viridibus dense pilis patentibus pallidis uncinulato-piloso, internodiis brevibus; stipulae virides membranaceae persistentes nervosae e basi lanceolato- vel ovato-cordata abrupte longiacuminatae vel cuspidatae hispido-ciliatae, aliter glabrae; petiolus gracilis 5–7 mm. longus pilosus, stipellis subulatis 3 mm. longis; foliolum 1 ovatum, ovato-oblongum vel lanceolato-oblongum 3.5–7 cm. longum 1–3 cm. latum, apice rotundatum et longe mucronatum, basi obtusum vel anguste rotundatum, membranaceum, supra in sicco viride, tuberculato-papillosum, sparse pilis longis albidis pilosum, venis prominulis reticulatis, subtus fere concolor subdense pilis albidis subadpressis pilosum; racemi paniculati laxe pauci- vel multiflori 7–23 cm. longi pedunculati, floribus remotis, rhachi dense viscido-pilosa, bracteis deciduis 5–8 mm. longis ovatis vel lanceolatis viridibus cuspidato-attenuatis nervosis, pedicellis gracillimis plerumque 9–13 mm. longis patentibus vel adscendentibus viscido-pilosis; calyx purpureus vix ultra 2 mm. longus sparse pilosulus profunde lobatus, lobis inaequalibus acutis vel acuminatis; corolla 5–6 mm. longa, petalis glabris; legumen fere sessile, in statu juvenili 2 mm. latum glabrum, utroque margine fere aequaliter crenato-lobatum, articulis vulgo 4–5 oblique orbicularibus isthmo angustissimo sejunctis.—Mexico: Guasaremos, Río Mayo, Chihuahua, on oak slopes, September 26, 1935, *Howard Scott Gentry 1867* (type in Herb. Field Mus.). Sierra Charuco, Río Mayo, Sonora, in canyon, September 10, 1935, *Gentry 1720.*

Flowers lavender. The plant belongs to the small number of *Desmodium* species having unifoliolate leaves.

Dialium guianense (Aubl.) Steud.—This widely distributed tree of tropical America has been recorded as far north as Guatemala and British Honduras. Specimens are now at hand from Mexico: Fortuño, Coatzacoalcos River, Veracruz, 30–50 meters, in 1937, *L. Williams 8448, 8936, 8647.* Ubero, Oaxaca, 30–90 meters, *Williams 9355, 9285.* Local names Paqui or Guapaqui. A tall tree, 20–27 meters or more in height, usually with conspicuous buttresses.

Ormosia isthmensis Standl., sp. nov.—Arbor 20–27-metralis, trunco 60 cm. et ultra diam., ramulis crassiusculis primo ut omnibus partibus novellis dense minute sordido-tomentulosis vel serius glabratis, internodiis brevibus; folia majuscula petiolata, rhachi cum petiolo 7.5–18 cm. longa sparse minute tomentella vel glabrata, petiolulis crassis 5 mm. longis; foliola 7–9 subcoriacea obovato-oblonga vel elliptico-oblonga 8–12 cm. longa 4–6 cm. lata, apice obtusa vel rotundata et abrupte breviter cuspidato-acuminata, basi rotundata vel obtusa, supra glabra, nervis venisque manifestis interdum prominulis, subtus primo minute sericea vel tomentulosa, cito glabrata, nervis utroque latere ca. 11 angulo semirecto adscendentibus subcurvis marginem fere attingentibus; inflorescentia cymoso-paniculata ampla in statu fructifero tantum visa; legumen 2–2.5 cm. latum sessile sed basi constrictum usque 5 cm. longum, apice late rotundatum et apiculatum fere glabrum; semina 1 vel 2 subcompressa subquadrata fere 1 cm. longa laete coccinea.—Mexico: Uberto, Oaxaca, 30–90 meters, June, 1937, *Llewelyn Williams 9423* (type in Herb. Field Mus.). Fortuño, Veracruz, 30–50 meters, March, 1937, *Williams 8926.*

Vernacular name Colorín. Crown wide-spreading or round; trunk unbranched for half its height, with or without small buttresses; bark light brown or grayish, fairly smooth or with numerous small excrescences; fruit dark brown or almost black when ripe; growing in fairly dense, tall forest. The second collection cited exhibits some differences from the type, and it is possible that it really represents a distinct species. This is, apparently the first *Ormosia* to be recorded from Mexico, a tree once described by the writer under that name having been transferred later to the genus *Dussia.*

Rhynchosia rariflora Standl., sp. nov.—Herbacea scandens, caule gracillimo dense pilis brevibus patentibus viscido-piloso, internodiis plerumque foliis paullo brevioribus; stipulae persistentes lineari-subulatae 4 mm. longae dense breviter pilosae virides; folia

parva 1–2.5 cm. longe petiolata, petiolo gracili viscido-piloso, rhachi ad 1 cm. longa, petiolulis vix ultra 1 mm. longis; foliola 3 ovato-deltoidea, ovato-oblonga vel lanceolato-oblonga inaequalia 2–3 cm. longa 1–1.5 cm. lata, acuta ad longiacuminata, terminale basi rotundatum, lateralia basi valde obliqua et rotundata, membranacea, supra in sicco viridia albido-papillosa et sparse pilosula, subtus fere concoloria, sparse glanduloso-puncticulata, dense molliter pilosula; racemi axillares foliis breviores vulgo laxe 2–3-flori, pedunculo gracili elongato, pedicellis gracilibus ad 5 mm. longis viscido-pilosis; calyx extus viscido-pilosus ca. 7 mm. longus, lobis tubo basi rotundato campanulato longioribus, inferiore aliis multo longiore, omnibus lanceolato-attenuatis; corolla 1 cm. longa, vexillo extus dense viscido-pilosulo; legumen sessile 18 mm. longum 7 mm. latum oblongum dense adpresso-pilosulum atque sparse longe viscido-villosum, apice oblique obtusum et subito in stylum 8 mm. longum contractum; semina 2.—Mexico: Guasaremos, Río Mayo, Chihuahua, valley margin, September 28, 1936, *Howard Scott Gentry 2883* (type in Herb. Field Mus.).

"A small vine growing among grasses; flowers yellow."

VOCHYSIACEAE

Vochysia hondurensis Sprague, Kew Bull. 183. 1922.—Mexico: Ubero, Oaxaca, 30–90 meters, June, 1937, *L. Williams 9467*. Local name Corpus or Corpo. A tree up to 27 meters high, the crown narrow, spreading or almost flat, rather dense; trunk 80 cm. in diameter, unbranched for 13 meters, the bark grayish, scaly; growing in dense, tall forest in dry loam. Previously a single representative of the genus, *V. tabascana* Sprague of Tabasco, has been known from Mexico.

EUPHORBIACEAE

Tetrorchidium rotundatum Standl. Trop. Woods 16: 44. 1928.—Heretofore the species has been found in Honduras and Nicaragua, but specimens are now at hand from Mexico: Fortuño, Coatzacoalcos River, Veracruz, 30–50 meters, March, 1937, *L. Williams 8387*. A straggly tree 5–6 meters high, with a spreading crown; trunk slender, branching about a meter from the base; growing in fairly dense forest.

Plukenetia angustifolia Standl. Field Mus. Bot. 4: 314. 1929. —Mexico: Ubero, Oaxaca, 30–90 meters, in 1937, *L. Williams 9166, 9358, 9390*. A slender, woody vine, growing usually in thickets along roadsides. Until now the species has been known only from Honduras, Guatemala, and British Honduras.

Phyllanthus Williamsii Standl., sp. nov.—Herba gracilis annua erecta glabra prope basin simplex, caule usque 60 cm. alto superne ramos paucos vel numerosos graciles erectos vel valde adscendentes emittente tereti viridi, ramis plerumque caule brevioribus; stipulae persistentes subulato-filiformes ca. 2 mm. longae; folia parva vix ad 1 mm. longe petiolata ovalia vel ovali-oblonga, interdum ovato-ovalia, 1–2 cm. longa 7–12 mm. lata apice late rotundata, interdum obscure subapiculata, basi late rotundata, tenuia, supra in sicco viridia, subtus paullo pallidiora, costa gracillima obscura, nervis lateralibus utroque latere 5–6 tenerrimis obscuris; flores monoeci axillares solitarii vel pauci et fasciculati, pedicellis filiformibus florum fertilium usque 5.5 mm. longis; sepala floris masculi vix ultra 1.5 mm. longa, floris feminei 5 in statu fructifero 3 mm. longa obovata viridia apice rotundata prominenter costata; capsula depresso-globosa sepalis solemniter brevior.—Mexico: Fortuño, Coatzacoalcos River, Veracruz, 30–50 meters, March, 1937, *Llewelyn Williams 8433* (type in Herb. Field Mus.), *8533*.

Local names Añilillo and Hierba de leche. Growing along paths or trails in forest. Evidently related to *P. lathyroides* HBK., which is similar in habit and general characters, but has much smaller and especially narrower leaves.

BOMBACACEAE

Ochroma concolor Rowlee, Journ. Wash. Acad. Sci. 9: 161. 1919.—Mexico: Ubero, Oaxaca, 30–90 meters, *L. Williams 9236*. Local name Corcho. A tree 12–15 meters high with wide-spreading crown; trunk 40 cm. in diameter, the bark smooth, pale grayish brown. The genus *Ochroma* has been reported previously from southern Mexico, but there has been doubt as to the species represented. The present material is satisfactorily referable to the species named above, but there is still much uncertainty as to which, if any, of the species named by Rowlee are really valid.

BEGONIACEAE

Begonia MacDanielsii Standl., sp. nov.—Herba ut videtur caulescens simplex ca. 60 cm. alta, caule crassiusculo superne subgeniculato subtereti plus minusve, ad nodos densius, pilis brevibus brunnescentibus vel ferrugineis villoso, internodiis elongatis; stipulae hyalinae ferrugineae vel pallidae ad 8 mm. longae triangulari-ovatae obtusae ciliatae deciduae; folia majuscula longissime petiolata tenuiter membranacea, petiolo 10 cm. longo et ultra sparse vel subdense breviter villosulo; lamina ambitu fere rotundata 8–15 cm. longa et aequilata vel latior, apice longe anguste attenuato-acuminata, basi breviter vel profunde aperte cordata, breviter angulato-lobata, lobis acutis inaequalibus, margine arcte inaequaliter repando-dentata et ciliata, dentibus acutis mucronatis, supra in sicco viridis subdense sed non conspicue pilis valde inaequalibus crassiusculis villosula, subtus densius villosula et puberula, basi 7-nervia; cymae axillares paniculam angustam valde elongatum efformantes, 2–5 cm. longe pedunculatae laxe pauci- vel multiflorae, ramis dense breviter villosis, pedicellis floriferis brevibus fere glabris, fructiferis gracillimis usque 4 cm. longis; sepala exteriora floris masculi ovato-rotundata 8 mm. longa et fere aequilata apice late rotundata, basi subcordata glabra ut videtur alba vel pallide rosea; bracteae parvae subrotundatae ciliatae vix ultra 3 mm. longae; capsula majuscula ca. 1.5 cm. longa, parte seminifera oblonga 6–7 mm. lata, ala maxima ad 1 cm. lata apice suboblique truncata, basi subtruncata vel late rotundata, alis alteris multo angustioribus ad 6 mm. latis tenuibus reticulato-venosis.—Mexico: In moist woods, Pié de La Cuesta, 10 miles north of Acapulco, Guerrero, 360 meters, August 23, 1935, *L. H. MacDaniels 207* (type in Herb. Field Mus.).

This plant is one of a large collection made in central Mexico by Mr. MacDaniels, and forwarded to the writer for determination by Dr. L. H. Bailey.

ARALIACEAE

Didymopanax Morototoni (Aubl.) Dcne. & Planch.—One of the common trees of the Atlantic lowland forests of Central America, but not listed previously from Mexico. The following collections are at hand from the Isthmus of Tehuantepec: Ubero, Oaxaca, 30–90 meters, in 1937, *L. Williams 9416, 9243, 9161.* Vernacular names Roble blanco, Chancarro blanco, Pié de gallo, and Mano de danto. A tree of 15–30 meters, with narrow, spreading crown; trunk 25–30 cm. or more in diameter, the bark smooth, light gray or grayish brown, on the lower part of the trunk brown and medium scaly; common on dry slopes in forest, or often on cut-over land.

ASCLEPIADACEAE

Vincetoxicum adenocardium Standl., sp. nov.—Herbacea volubilis (?), caule crasso subtereti ubique dense puberulo et pilis longiusculis albidis patentibus plurilocularibus sat dense piloso, internodiis 2–3 cm. longis; folia parva longipetiolata crasse herbacea, petiolo crassiusculo 1.5–2.5 cm. longo dense puberulo et albido-piloso; lamina late ovato-cordata 3–5 cm. longa 2.5–3.5 cm. lata subabrupte longe anguste acuminata, basi profunde (ca. 8 mm.) cordata, sinu angusto, lobis posticis rotundatis, supra in sicco viridis dense pilis albidis attenuatis pilosa, tactu mollis, subtus fere concolor, ubique dense albido-glanduloso-puberula, ad venas albido-villosa, basi 5–7-nervia, nervis venisque prominentibus conspicuis pallidis reticulatis; flores racemosi, racemis axillaribus solitariis petiolo paullo brevioribus dense pauci- vel multifloris, pedicellis hispidulis ad 3 mm. longis; sepala viridia lanceolata fere 2 mm. longa extus hispidula acuta; corolla ut videtur brunneo-purpurea extus sparse hispidula, tubo calyci aequilongo, lobis linearibus intus glabris ca. 8 mm. longis vix ultra 1 mm. latis obtusis suberectis, marginibus plus minusve recurvis.—Mexico: Presa de Chihuahua, State of Chihuahua, June 22, 1936, *Harde LeSueur 845* (type in Herb. Field Mus.).

Noteworthy for the dense, glandular covering of the lower leaf surface, also for the linear corolla lobes. The plant is probably scandent, but it is possible that it is rather prostrate.

Vincetoxicum belizense Lundell & Standl., sp. nov.—Herba scandens, caulibus gracilibus striatis adpresso-pilosis; petioli graciles striati 5–17 mm. longi puberuli; lamina ovata vel ovato-oblonga 4.5–7.5 cm. longa 2–4.5 cm. lata, apice acuto-acuminata, basi breviter cordata, subchartacea, supra griseo-viridis et pilis paucis brevibus adpressis secus nervos exceptis glabra, subtus pallidior pilis paucis brevibus secus costam exceptis glabra; pedunculi axillares 8–12 mm. longi puberuli, floribus paucis (ca. 8–12) subumbellatis, pedicellis gracilibus striatis puberulis 6–10 mm. longis; calyx ad basin 5-partitus, sepalis lineari-lanceolatis ca. 3 mm. longis 1 mm. latis apice subobtusis intus glabris, extus puberulis, sepalis cum appendicibus 5 parvis basalibus alternantibus; corolla rotata fere ad basin 5-loba 18–20 mm. diam., lobis anguste lanceolatis ca. 9 mm. longis 3 mm. latis apice acutiusculis, intus glabris, extus sparse puberulis; corona exterior glabra carnosa profunde 5-loba, lobis 4-dentatis intus irregulariter appendiculatis.—British Honduras: Corozal District, 1931–32, *Percy H. Gentle 299* (type in Herb. Univ. Michigan; photo. in Herb. Field Mus.).

Vernacular name, Dama de noche. Distinguished by the appressed pubescence of the stems, small, lanceolate sepals and corolla lobes, and the deeply 5-lobate, dentate outer corona.

Vincetoxicum Gentlei Lundell & Standl., sp. nov.—Herbacea scandens, caulibus ut petiolis pedunculisque pilis brevibus nigris basi tuberculato-dilatatis atque aliis longioribus rigidulis intermixtis dense brevihirsutis; petioli graciles striati 3–7 cm. longi; lamina late ovata vel ovato-suborbicularis 7.5–13 cm. longa 5.3–10 cm. lata, apice subito breviter acuto-acuminata, basi profunde cordata, sinu angusto, membranacea, supra obscure viridis sparse pubescens, subtus pallide lutescenti-viridis atque dense molliter fulvo-pubescens, ad nervos breviter hirsuta; pedunculi axillares 3–7.5 cm. longi minute striati; flores pauci (4 et ultra) subumbellati, pedicellis gracilibus striatis 1.5–2.5 cm. longis; calyx viridis 5-partitus, sepalis orbicularibus ca. 3.8 mm. longis 3-nerviis intus glabris, extus pilis brevibus nigris basi tuberculiformibus et aliis longis rigidulis intermixtis brevihirsutis, sepalis cum appendicibus 5 parvis basalibus alternantibus; corolla luteo-viridis rotata profunde 5-loba 15–16 mm. diam., lobis suborbicularibus ca. 5 mm. longis 6–7 mm. latis obscure irregulariter crenulatis, intus glabris, extus hirtellis atque pilis paucis nigris basi tuberculiformibus conspersis; corona glabra subintegra; folliculi lanceolati ca. 7 cm. longi 1.3–1.7 cm. diam., tuberculis 5–9 mm. longis conspersi, breviter hirsuti atque pilis rigidulis basi incrassatis induti.—British Honduras: In forest on a hill slope near Gracie Rock, Sibun River, January 31, 1936, *C. L. Lundell 1779* (flowers) and *1780* (fruit) (type in herb. Univ. Michigan; photo. in Herb. Field Mus.). Corozal District, San Andres, *Gentle 541;* a vine in high ridge.

Noteworthy for its small, green flowers, large, ovate-suborbicular leaves, and black, tuberculate pubescence. Only one flower in an umbel is open at a time. Because of the pubescence, the fruits have a black appearance.

Vincetoxicum Hatchii Standl., sp. nov.—Volubilis, caule crasso tereti viridi densiuscule pilis brevibus sordidis patentibus piloso; folia permagna longissime petiolata membranacea, petiolo gracili (in folio uno viso) 21 cm. longo dense breviter piloso; lamina fere orbicularis 21 cm. longa 18 cm. lata, apice rotundata et abrupte acuminata, acumine triangulari-attenuato 3 cm. longo, basi profunde (4 cm.) cordata, sinu angusto fere clauso, lobis posticis late rotundatis, supra in sicco viridis ubique pilis longiusculis mollibus patentibus pilosa, subtus fere concolor, densius pilis paullo brevioribus molliter pilosa, basi 7-nervia, costa utroque latere nervos laterales 3 emittente, nervis venisque prominentibus laxe reticulatis; calyx 1.5 cm. longus dense breviter patenti-pilosulus fere ad basin

5-lobus, lobis ellipticis 6–8 mm. latis obtusis viridibus prope basin paullo angustatis; corolla rotata 4 cm. lata extus subsparse minute puberula, ad medium 5-loba, lobis rotundato-ovatis ca. 1.5 cm. latis apice subretusis intus glabris solemniter reticulato-venosis; corona annularis 6 mm. diam. 5-loba, lobis rotundato-truncatis obscure crenato-lobulatis, gynostegio obscure pentagono.—Guatemala: Cerro Sobre, Finca Seamay, Senahú, Alta Verapaz, 900 meters, July 24, 1936, *W. R. Hatch & C. L. Wilson 107* (type in Herb. Field Mus.).

Noteworthy for the extremely large, almost orbicular leaves, and for the large flowers.

Vincetoxicum LeSueurii Standl., sp. nov.—E radice crassa perennis, caulibus numerosis ut videtur prostratis dense pilis longis albis patentibus vel subretrorsis pilosis, internodiis brevibus; folia parva numerosa breviter petiolata herbacea, petiolo crasso dense albo-piloso; lamina late ovata vel rotundato-ovata 8–11 mm. longa 5–9 mm. lata plus minusve inaequilateralis, apice obtusissima vel subrotundata, basi cordata, sinu aperto, supra viridis glabra, subtus densissime pilis longis albis setuloso-pilosa; umbellae axillares numerosae laxe multiflorae, pedunculo crasso 1.5–2.5 cm. longo dense patenti-piloso, pedicellis 4–7 mm. longis dense pilosis, floribus ut videtur interdum cernuis; calyx 4 mm. longus extus dense albo-pilosus, profunde 5-lobus, lobis oblongo-ovatis obtusis erectis; corolla ut videtur atropurpurea 7–8 mm. longa intus glabra, fere ad basin 5-loba, lobis erectis lanceolato-oblongis obtusis, extus apicem versus prope medium pilis perpaucis albis setiformibus conspersis, solemniter longitrorsum fusco-lineatis.—Mexico: Majalca, Chihuahua, June 24, 1936, *Harde LeSueur 844* (type in Herb. Field Mus.).

Closely related to **Vincetoxicum nummularium** (Dcne.) Standl., comb. nov. (*Chthamalia nummularia* Dcne. in DC. Prodr. 8: 605. 1844), which differs in having longer pedicels and a densely setulose-pilose corolla; also to **V. chihuahuense** (Gray) Standl., comb. nov. (*Gonolobus chihuahuensis* Gray, Proc. Amer. Acad. 21: 398. 1886), in which the leaves are densely pilose on the upper surface.

Vincetoxicum Pittieri Standl., sp. nov.—Scandens, caulibus teretibus gracilibus viridibus glabris, internodiis plerumque foliis longioribus; folia modica petiolata herbacea, petiolo gracili 2 cm. vel paullo ultra longo puberulo vel fere glabro; lamina oblongo-elliptica vel ovato-oblonga 5.5–8.5 cm. longa 2.5–4 cm. lata longiuscule sensim acuminata, basi rotundata et interdum subemarginata, glabra vel subtus ad costam sparse puberula, supra in sicco fusco-viridis, costa nervisque prominulis, subtus concolor, costa gracili prominente, nervis lateralibus utroque latere ca. 5 angulo semirecto adscendentibus arcuatis, venis paucis inconspicuis laxissime reticulatis; umbellae axillares solitariae 2–3 cm. longe pedunculatae, pedicellis gracilibus 1.5–2 cm. longis sparse minute puberulis; calyx 3.5 mm. longus extus puberulus fere ad basin 5-lobus, lobis oblongis obtusis erectis; corolla ca. 14 mm. longa rotata extus sparse puberula, intus versus basin pilis longis laxissimis albidis pilosa, lobis tubo duplo longioribus late triangulari-ovatis, apice obtusis et interdum breviter emarginatis, conspicue longitrorsum lineatis; corona fere 5 mm. lata profunde 5-loba, lobis remotis obreniformibus basi abrupte contractis et substipitatis, apice retusis, gynostegio pentagono 2.5 mm. lato.—Panama: Forests along the Río Ladrillo and vicinity, above El Boquete, Chiriquí, 1,200–1,300 meters, March, 1911, *H. Pittier 3059* (type in Herb. Field Mus.).

Vincetoxicum quercetorum Standl., sp. nov.—Scandens, ut dicitur suffruticosa, caule gracili viridi tereti densissime viscido-puberulo et subdense pilis albidis patentibus rigidulis hirsuto, internodiis foliis longioribus; folia modica petiolata membranacea, petiolo gracili 1.5–3 cm. longo puberulo et hirsuto; lamina oblongo-triangulari-ovata 5–8 cm. longa 2–4 cm. lata longe anguste sensim attenuata, basi cordata, lobis posticis rotundatis, supra in sicco viridis sat dense breviter villosa, nervis venisque vix elevatis, subtus paullo pallidior, sat dense puberula, ad venas villosula, costa utroque latere nervos ca. 4 emittente, venis obscuris; umbellae axillares solitariae interdum racemiformes laxe pauciflorae, pedunculo 2–2.5 cm. longo gracili dense puberulo et sparse hirsuto, pedicellis usque 2 cm. longis dense viscido-puberulis et sparse hirsutis, bracteis viridibus linearibus vel lanceolatis conspicuis ad 8 mm. longis; calyx viridis ca. 8 mm. longus extus minute puberulus et hinc inde hirsutus adpressus fere ad basin 5-lobus, lobis ciliatis oblongo-ovatis acutis; corolla ut dicitur coeruleo-purpurea fere 2 cm. longa rotata extus sparse minute puberula vel fere glabra, intus omnino glabra, fere ad basin 5-loba, lobis oblongis vel anguste triangulari-oblongis apicem subobtusum versus plus minusve attenuatis solemniter reticulato-venosis; corona 5 mm. diam. fusca breviter 5-loba, lobis crassis suberectis, apice late obtuso subretuso incurvo, gynostegio pentagono ad 4.5 mm. lato.—Mexico: Sierra Charuco, Río Mayo, Sonora, on oak slope, July 22, 1936, *Howard Scott Gentry 2297* (type in Herb. Field Mus.).

"A scandent perennial; old wood erect, the new trailing. Flowers olive-green, bluish purple in the saucer."

Vincetoxicum tristiflorum Standl., sp. nov.—Frutex scandens, ramis vetustioribus lignosis pallidis rimosis, novellis viridibus teretibus dense glanduloso-puberulis et pilis albidis patentibus rigidis hirsutis, internodiis plerumque elongatis; folia modica longipetiolata membranacea, petiolo gracili 2.5–5 cm. long glanduloso-puberulo et sparse hirsuto; lamina ovato-cordata, interdum rotundato-ovata vel subtriangulari-ovata, 5.5–11 cm. longa 3–6 cm. lata sublonge acuminata, basi profunde (ca. 1 cm.) cordata, sinu aperto lato vel subangusto, lobis posticis rotundatis, supra in sicco viridis pilosa, nervis manifestis et subprominulis, subtus paullo pallidior viscido-puberula et ad nervos breviter villosula, basi 5-nervia, costa utroque latere nervos 2 laterales emittente, venis obscuris; umbellae axillares solitariae, interdum racemiformes, laxe pauci- vel multiflorae, pedunculo gracili vulgo 2–2.5 cm. longo viscido-puberulo et sparse hirsuto, pedicellis gracilibus plerumque 8–12 mm. longis glanduloso-puberulis et sparse hirsutis, bracteis viridibus linearibus vel fere subulatis usque 5 mm. longis; calyx viridis 4–5 mm. longus extus sparse hirtellus fere ad basin 5-lobus, lobis oblongo-lanceolatis ciliatis acutis vel acuminatis; corolla ut videtur campanulata in sicco atropurpurea 12 mm. longa extus sparse minute puberula vel fere glabra, intus glabra, fere ad basin 5-loba, lobis anguste lanceolato-oblongis ca. 3 mm. latis apicem acutiusculum versus longe sensim attenuatis; corona 2.5 mm. diam. annularis breviter 5-loba, gynostegio pentagono.—Mexico: Guasaremos, Río Mayo, Chihuahua, forest slope, a purple-flowered vine with Burseras, in woods, August 23, 1936, *Howard Scott Gentry 2415* (type in Herb. Field Mus.). San Bernardo, Río Mayo, Sonora, August 24, 1935, *Gentry 1626*. Río Bonito, Chihuahua, August, 1936, *Harde LeSueur 840*.

Gentry reports the Warahío name as "mahoy píwala," and states that the young and tender fruit is roasted and eaten by the native people.

LABIATAE

Agastache ionocalyx (Robinson) Standl., comb. nov. *Brittonastrum ionocalyx* Robinson, Proc. Amer. Acad. 43: 25. 1907.

Agastache Palmeri (Robinson) Standl., comb. nov. *Brittonastrum Palmeri* Robinson, Proc. Amer. Acad. 43: 25. 1907.

SOLANACEAE

Physalis caudella Standl., sp. nov.—Herba ramosa perennis, ramis crassiusculis tortuosis subdense pilis albidis crassiusculis laxis villosis, internodiis brevibus; folia modica longipetiolata herbacea, petiolo usque 1.5 cm. longo, altero latere propter basin laminae decurrentem interdum 7 mm. longiore, saepius fere ad basin alato-marginato villoso; lamina lanceolata vel oblongo-lanceolata 3.5–6.5 cm. longa 1.5–2 cm. lata longe attenuato-acuminata, basi insigniter inaequali acuta, in sicco laete viridis, supra sparse villosa vel glabrata, subtus paullo densius praesertim ad nervos albido-villosa, margine integro vel interdum remote breviter repando-dentato; flores axillares solitarii, pedicellis gracilibus recurvis usque 8 mm. longis albido-villosis; calyx in statu florifero 11 mm. longus dense pilis longis laxis albidis villosus profunde 5-lobus, lobis anguste lanceolatis tubo duplo longioribus longissime anguste attenuatis; corolla lutea, fauce brunneo-purpurea, extus ad nervos sparse longivillosa, late campanulata, fere 2.5 cm. longa; calyx fructifer late ovoideus usque 5 cm. longus basi depressus 3 cm. latus pallide viridis lucidus, solemniter reticulato-venosus, sparse breviter villosulus; bacca globosa ca. 1.5 cm. diam.—Mexico: Cajurichi, Río Mayo, Chihuahua, 2,160 meters, on pine-oak slope, September 13, 1936, *Howard Scott Gentry 2710* (type in Herb. Field Mus.).

Noteworthy for the very large fruiting calyces with extremely narrow and greatly elongate lobes.

Physalis eximia Standl., sp. nov.—Herba ramosa annua(?), ramis crassis ut videtur carnosis glanduloso-puberulis et sparsius pilis longiusculis patentibus laxis glanduloso-villosis, internodiis elongatis; folia majuscula longipetiolata herbacea, petiolo crassiusculo 1.5–5.5 cm. longo glanduloso-villoso; lamina rotundato-ovata vel rotundato-deltoideo-ovata 5.5–9 cm. longa 4–7.5 cm. lata acuta vel subobtusa, basi valde inaequali breviter vel profundius cordata, altero latere interdum 6 mm. breviore, lobis posticis rotundatis vel interdum acutiusculis, in toto margine grosse inaequaliter undulato-dentata vel saepe sublobata, dentibus vel lobis obtusis, supra subdense breviter villosula, subtus praesertim ad nervos pilis brevibus albidis villosula, nervis lateralibus utroque latere ca. 5; flores axillares solitarii cernui, pedicellis gracillimis usque 3.5 cm. longis dense glanduloso-villosis; calyx in statu florifero 1.5 cm. longus basi late rotundatus vel truncatus densiuscule viscido-villosus viridis campanulatus, lobis anguste triangularibus sensim filiformi-attenuatis; corolla campanulata ut videtur viridi-lutea et fauce immaculata 3.5

cm. longa extus glabra vel tantum ad nervos minute puberula.—Mexico: Majalca, Chihuahua, June 24, 1936, *Harde LeSueur 894* (type in Herb. Field Mus.).

RUBIACEAE

Bertiera guianensis Aubl. Pl. Guian. 180. 1775.—The species, a frequent shrub of the Central American tierra caliente, has been known to range as far north as British Honduras. The following collections attest the fact that its range extends to the Isthmus of Tehuantepec: Ubero, Oaxaca, Mexico, 30–90 meters, in 1937, *L. Williams 9372, 9177, 9404, 9312.* Local names Cafecillo and Crucecillo; a shrub 2 meters high or less, sometimes subscandent, the small flowers white. Frequent on slopes in thickets or forest.

Coussarea Duckei Standl. Field Mus. Bot. 8: 174. 1930.

Of this exceptionally well marked species it is now possible to report another collection, of a date earlier than that of the type: Brazil: Rio Tapajoz, a shrub of 2–3 meters, flowers white, December 7, 1915, *Ducke 15857* (herb. Mus. Paraensis).

Coussarea mexicana Standl., sp. nov.—Arbor 9–11-metralis, trunco usque 25 cm. diam., omnino glabra, ramulis crassiusculis pallide lenticellatis, internodiis brevibus vel interdum valde elongatis; stipulae persistentes et induratae late ovatae obtusae vix 3 mm. longae subpatentes; folia mediocria brevissime petiolata subcoriacea, petiolo crassiusculo 3–5 mm. longo; lamina oblongo-elliptica 8–15 cm. longa 3.5–6.5 cm. lata, apice obtusa et breviter abrupte caudato-acuminata, acumine obtuso usque 1 cm. longo, basi acuta vel acuminata vel interdum attenuata, supra lucida, nervis venisque prominulis, subtus fere concolor vix lucida, costa gracili prominente, nervis lateralibus utroque latere ca. 7 angulo lato divergentibus gracillimis prominulis arcuatis prope marginem arcuato-conjunctis, venulis vix prominulis laxe reticulatis, axillis nervorum brevissime barbatis et domatiatis; inflorescentia terminalis thyrsoideo-paniculata subdense multiflora fere 2 cm. longe pedunculata, ca. 4 cm. longa atque 5 cm. lata, ramis crassiusculis atque ad nodos valde incrassatis, floribus cymosis, cymis paucifloris congestis, pedicellis crassiusculis vix ad 2 mm. longis; hypanthium turbinatum fere 2 mm. longum; calyx late campanulatus 2.5 mm. longus remote undulato-dentatus; corolla alba 12 mm. longa, tubo crassiusculo superne subdilatato, lobis lanceolato-oblongis obtusis tubo paullo longioribus.—Mexico: Ubero, Oaxaca, 30–90 meters, June, 1937, *Llewelyn Williams 9442* (type in Herb. Field Mus.).

A tree with spreading crown; trunk straight, round, unbranched for about 3.5 meters; bark greenish; wood brown throughout, used for railroad ties, sometimes for house construction and fuel. This is, apparently, the first record of the genus *Coussarea* for Mexico.

Guettarda Duckei Standl., sp. nov.—Frutex, ramulis teretibus ferrugineis, interdum spinis crassis rectis patentibus ca. 1.5 cm. longis armatis, novellis strigillosis et sparse hirsutis, internodiis plus minusve elongatis; stipulae deciduae 5 mm. longae vel ultra ovatae extus dense strigosae; folia majuscula breviter petiolata firme membranacea, petiolo gracili 5–20 mm. longo adpresso-hirsuto; lamina elliptica vel ovato-elliptica 9–15 cm. longa 4.5–8 cm. lata acuta vel breviter acuminata, basi rotundata vel obtusa, interdum subemarginata, supra in sicco fusca lucida sparse pilis brevibus subpatentibus setuloso-pilosa, costa nervisque prominentibus, nervulis prominulis, subtus paullo pallidior, ad costam strigosa, aliter dense velutino-pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 12 gracillimis prominentibus angulo latiusculo adscendentibus arcuatis marginem fere attingentibus; inflorescentiae axillares multiflorae compactae cymosae ca. 2.5 cm. latae, pedunculo gracili ad 12.5 cm. longo strigilloso et subadpresse hirsuto, bracteis lineari-subulatis calyce brevioribus, floribus sessilibus vel breviter pedicellatis; hypanthium vix ultra 1.5 mm. longum latum; calyx tubulosus 2 mm. longus truncatus dense ochraceo-tomentellus; corolla extus pilis erectis ochraceis dense sericea, tubo 1 cm. longo superne 1.5 mm. lato, lobis rotundatis ca. 2 mm. longis patentibus intus glabris; fructus ovalis in sicco 2 cm. longus 1 cm. latus densissime adpresse tomentellus teres, putamine 4-loculari.—Brazil: Almeirim, campo baixo, December 14, 1902, *A. Ducke 3056* (type in Herb. Field Mus.). Itacoatiara, beira, varzea, Igarapé da boca do Lago de Serpa, July 4, 1913, *Ducke 12500* (herb. Mus. Paraensis). Here may belong also *Ducke 2181* from M. Calmen, Ceará.

Related to *G. boliviana* Standl., a species with much larger corollas.

Hoffmannia Lawrancei Standl., sp. nov.—Frutex 2–2.5 m. altus, trunco ad 3.5 cm. diam., ramis crassis fuscis teretibus, novellis glabris; stipulae non visae; folia inter maxima breviter petiolata herbacea, petiolo crasso ad 2.5 cm. longo glabro; lamina oblonga vel oblongo-elliptica ca. 27 cm. longa atque 9–12.5 cm. lata, apice obtusa vel rotundata et subito triangulari-acutata, apice ipso acuto, basi sensim vel subabrupte acutata et plus minusve decurrens,

glabra, supra in sicco fuscescens opaca, costa nervisque prominulis, subtus brunnescens, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 15 angulo lato adscendentibus obliquis arcuatis prope marginem arcuato-conjunctis; flores cymosi, cymis laxe paucifloris petiolis subaequilongis graciliter pedunculatis ad nodos ramorum crassiorum fasciculatis, ramis rubris glabris, pedicellis gracillimis usque 1 cm. longis; hypanthium ca. 2 mm. longum oblongo-obovoideum teres glabrum, calyce 2.5 mm. lato obscure remote denticulato; corolla lutea in alabastro 7 mm. longa extus glabra apice acutiuscula, lobis linearibus tubo plus quam duplo longioribus.—Colombia: Region of E. Chapón, State of Boyacá, in thin forest at brook side, 1,110 meters, May 9, 1932, *A. E. Lawrance 28* (type in Herb. Field Mus.).

Hoffmannia macrosiphon Standl., sp. nov.—Frutex 2-metralis ut videtur ramosus, ramis gracilibus teretibus viridescentibus glabris, internodiis brevibus; stipulae parvae deciduae; folia inter minora petiolata membranacea opposita, petiolo 8–22 mm. longo glabro gracili; lamina anguste oblanceolato-oblonga 7–12.5 cm. longa 2.3–3.2 cm. lata, apicem obtusum versus longe anguste attenuata vel interdum abrupte acuminata, basin versus longe sensim attenuata, glabra, supra in sicco griseo-viridis opaca, nervis obsoletis, subtus multo pallidior, costa crassiuscula vix prominula, nervis lateralibus utroque latere ca. 8 angulo lato adscendentibus inconspicuis, venis obsoletis; flores cymosi, cymis axillaribus solitariis 2–3-floris graciliter ad 3 cm. longe pedunculatis, pedicellis gracillimis ca. 1 cm. longis; hypanthium anguste oblongum 4 mm. longum ca. 1.5 mm. latum glabrum, calyce 2.5 mm. lato breviter obtuse dentato erecto; corolla extus glabra, tubo 2 cm. longo basi fere 2 mm. lato, fauce subito dilatato et 5 mm. lato, lobis late rotundato-ovatis obtusis ca. 6 mm. longis subpatentibus intus glabris; antherae semiexsertae fere 4 mm. longae; stylus antheras aequans, ramis crassis 2 mm. longis.—Guatemala: In heavy forest, Volcán Zunil, Dept. Quezaltenango, 2,400 meters, August 4, 1934, *Alexander F. Skutch 937* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

"Corolla tube white suffused with red; lobes dull red on the margin, yellowish in the center. Berries red." The species is an isolated one, so much so, especially as regards the shape and size of the corolla, that its reference to *Hoffmannia* is somewhat questionable. There is, apparently, no other genus to which it might be referred, and with the material now available there seem to be no grounds for giving it separate generic rank.

Ixora faroensis Standl., sp. nov.—Frutex 1.5 m. altus ut videtur dense ramosus, ramis sat crassis rigidis teretibus, novellis in sicco stramineis plus minusve compressis glabris, internodiis brevibus; stipulae persistentes e basi lata subulatae rigidae glabrae; folia parva brevissime petiolata rigido-coriacea, petiolo crasso vix ad 3 mm. longo; lamina anguste lanceolato-oblonga, in sicco saepe complicata, 4–7 cm. longa 0.8–1.8 cm. lata sensim acuminata, basi acuta, glabra, supra lucidissima, costa gracili valde elevata, nervis venisque obsoletis, subtus fere concolor brunnescens lucida, costa prominente, nervis lateralibus utroque latere ca. 11 obscuris angulo fere recto abeuntibus, prope marginem arcuato-conjunctis, venis obsoletis, margine saepe recurvo; inflorescentia terminalis cymoso-corymbosa laxe multiflora, ca. 2 cm. longa et aequilata vel latior, pedunculata, bracteis parvis lanceolatis vel subulatis, ramis puberulis, pedicellis 2–4 mm. longis puberulis; hypanthium obovoideum 1 mm. longum puberulum, calyce aequilongo puberulo, lobis ovatis acutis suberectis; corolla rosea puberula, tubo 8 mm. longo gracili superne paullo dilatato, lobis patentibus ellipticis obtusis 3–3.5 mm. longis intus glabris; antherae semiexsertae.—Brazil: Campos a E. do Faro, August 27, 1907, *A. Ducke 8521* (type in herb. Mus. Paraensis; fragment in Herb. Field Mus.), *8522*.

A well marked species because of the rather small and very narrow leaves.

Ixora Martinsii Standl., sp. nov.—Rami subgraciles teretes in sicco fusco-olivacei striati glabri, internodiis brevibus vel elongatis; stipulae adpressae ca. 6 mm. longae e basi lata subulatae glabrae persistentes; folia mediocria breviter petiolata subcoriacea, petiolo crasso ad 1 cm. longo glabro; lamina lanceolato-oblonga vel ovato-oblonga 8.5–14.5 cm. longa 4–5 cm. lata breviter acuminata, interdum tantum subacuta, basi acuta vel subacuminata, glabra, supra in sicco brunneo-olivacea lucidissima, costa gracili prominente, nervis venisque prominentibus et solemniter conspicuis, subtus fere concolor opaca, costa prominente, nervis lateralibus utroque latere ca. 15 angulo lato fere recto abeuntibus irregularibus subarcuatis remote a margine arcuato-conjunctis, venulis prominulis arcte reticulatis; inflorescentia terminalis cymoso-corymbosa laxe multiflora basi trichotoma pedunculata ca. 8 cm. longa et aequilata, ramis glabris valde adscendentibus, bracteis lanceolatis vel subulatis parvis, infimis interdum foliaceis sed parvis, flore centrali cymulae sessili, lateralibus ad 2 mm. longe pedicellatis; hypanthium obconicum 1 mm. longum, calyce truncato vix ultra 0.5 mm. longo;

corolla extus glabra, tubo gracili 5–6 mm. longo superne vix dilatato, lobis patentibus oblongo-ovalibus apice obtusis vel rotundatis tubum fere aequantibus; antherae lineares breviter exsertae ca. 3 mm. longae; fructus globosus glaber 5 mm. diam.—Brazil: Monte Alegre, serra, September 7, 1908, *Oscar Martins 9828* (type in herb. Mus. Paraensis; fragment in Herb. Field Mus.), *9827*.

Morinda panamensis Seem. Bot. Voy. Herald 136. 1854.—Mexico: Ubero, Oaxaca, in low forest, 30–90 meters, May. 1937, *L. Williams 9387*. Local name Calabaza. A tree 15 meters high or more, the crown somewhat rounded or spreading, fairly dense; trunk fluted, 40–60 cm. in diameter, unbranched for 9 meters, the bark dark brown; wood deep yellow. The species is new for the Mexican flora.

Pagamea Duckei Standl., sp. nov.—Ramuli crassi teretes basibus longe persistentibus stipularum occultis, internodiis brevissimis; stipulae basi circumscissiles ca. 13–20 mm. longae ferrugineae longitrorsum striatae extus dense breviter ferrugineo-hirtellae apice laciniato-lobatae; folia majuscula petiolata subcoriacea, petiolo crasso ca. 1 cm. longo dense breviter ferrugineo-piloso; lamina anguste elliptico-oblonga 8.5–15 cm. longa 4–4.8 cm. lata subabrupte breviter acuminata, acumine angusto attenuato, basin versus paullo angustata et subabrupte longe decurrens, supra in sicco fusca sublucida sparse setoso-hirsuta, ad nervos dense ferrugineo-hirsuta, nervis solemniter impressis, subtus fere concolor ubique ad nervos densius pilis rigidulis ferrugineis pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 11 angulo angusto adscendentibus prominentibus versus apicem arcuatis marginem fere attingentibus, venis obscuris; inflorescentiae axillares et pseudoterminales capituliformes densissime multiflorae ca. 1 cm. longae et paullo latiores, pedunculo crasso complanato ca. 1 cm. longo dense ferrugineo-piloso; calyx parvus dense villosulus, lobis late ovatis obtusis; corolla extus dense breviter villosula, tubo fere 5 mm. longo superne paullo dilatato, lobis patentibus vel subrecurvis tubo paullo brevioribus obtusis intus densissime pilis longis albidis villosis.—Brazil: Tarumá-miry, campina cerrada, terra firme, December 22, 1912, *A. Ducke 12415* (type in herb. Mus. Paraensis; fragment in Herb. Field Mus.).

Most closely related to *P. plicata* Spruce, but differing in the dense, capitate inflorescence, in having the leaves acuminate and at the base long-decurrent, and also in the somewhat different pubescence of the leaves.

Pagamea guianensis Aubl., var. **typica** Standl., var. nov.—*P. guianensis* Aubl. Pl. Guan. 1: 113. 1775. Folia omnino glabra vel subtus tantum in axillis nervorum sparse barbata; corolla extus glabra; pedunculi glabri vel breviter puberuli.

Pagamea guianensis Aubl. var. **pilosa** Standl., var. nov.—Folia subtus sparse vel subdense, ad nervos longius densius, hirtella; pedunculi dense hirtelli vel pilosi; calyx vulgo hirtellus, interdum glabratus; corolla extus dense breviter hortella, rarius glabra.—Brazil: Amazonas, Humayta, on plateau between Rio Livramento and Rio Ipixuna, November, 1934, *B. A. Krukoff 7083* (type in Herb. Field Mus.). The following collections are in the herbarium of the Pará Museum: Campos east of Faro, August, 1907, *Ducke 8462*; a small shrub. Região do Alto Ariramba, campina pantanosa do jaramacarú, *Ducke 11287*. Região dos campos a E. de Faro, *Ducke 10657*, a large shrub. Alto Ariramba, porto da Cachoeira Terminus, matto do barranco d'um igarapé, December, 1910, *Ducke 11401*; a tree with brown flowers. Região do Alto Ariramba, campinarana, porto do jaramacarú, ilha da matta pantanosa, December, 1910, *Ducke 11338*.

The new variety described seems to differ from the typical form of *P. guianensis* chiefly if not wholly in pubescence, and there is considerable variation in the quality and amount of pubescence in the specimens cited. Most of the other species of the genus are either quite glabrous or abundantly pubescent, but in this instance I believe that the pubescence has no more than varietal significance.

Pagamea capitata Benth.—The species has been collected at various localities in British Guiana, and at least once in Surinam. It may be reported also from Venezuela: Río Cuquinán, December, 1909, *Ule 8767* (herb. Mus. Paraensis).

Pagamea coriacea Spruce—The following Brazilian collections may be reported for this rare species: Obidos, campina de areia ao sul da Serra do Valha-me Deus, July, 1912, *Ducke 12033*; Rio Madeira, Campina des Marmellos, March, 1902, *Ule 6101*; Rio Mapuera, campinarana northeast of Taboleirinho, December, 1907, *Ducke 9129*. Specimens all in herb. Mus. Paraensis. Described as a large shrub with black fruits.

Pagamea hirsuta Spruce—Known previously only from Spruce's original collection. The following collection is in the herbarium of the Pará Museum: Caquetá, Cerro de Cupaty, parte supérior, Alto Rio Negro, November, 1912, *Ducke 12288*.

Pagamea thyrsiflora Spruce—This species, also, has been known only from the original collection, from San Carlos on the Rio Negro. The following collection in the Pará Museum is conspecific: Rio Tapajoz, Bella Vista, campina do Perdido, February, 1917, *Ducke 16786.*

Palicourea roraimae Standl., sp. nov.—Frutex 1-2-metralis omnino glaber, ramulis gracilibus subteretibus in sicco fuscis, internodiis brevibus vel elongatis; stipulae crassae suberectae persistentes, vagina ca. 2 mm. longa in lobos 2 breves vix ultra 1 mm. longos latos obtusos desinente; folia parva breviter petiolata coriacea, petiolo crasso ad 4 mm. longo; lamina lanceolato-oblonga 3.5–5.5 cm. longa 1–1.8 cm. lata breviter acuminata, basi acuta, supra in sicco fusca vix lucida, costa tenera manifesta, nervis venisque obsoletis, subtus pallidior brunnescens lucidissima, costa gracili valde elevata, nervis lateralibus utroque latere 8–9 angulo lato adscendentibus arcuatis marginem fere attingentibus, venulis prominulis laxe reticulatis, subtus ubique dense minute pallido-puncticulata; inflorescentia terminalis cymosa dense pauci- vel multiflora ca. 2.5 cm. longa et 1.5 cm. lata graciliter 3–5 cm. longe pedunculata, basi trichotoma, ramis basalibus ebracteatis, ramis omnibus brevibus erectis, bracteis conspicuis linearibus ad 12 mm. longis attenuatis, floribus sessilibus; hypanthium breve, calyce vix 1 mm. longo, dentibus ovatis; corolla aurantiaca extus glabra 1.5 cm. longa in alabastro apice rotundata, tubo superne crasso, lobis brevibus.—Brazil: Roraima, on slopes at 2,300 meters, December, 1909, *E. Ule 8765* (type in herb. Mus. Paraensis; fragment in Herb. Field Mus.).

The type collection was determined by Schumann as a new species of *Rudgea*, which has remained unpublished.

Psychotria chaponiana Standl., sp. nov.—Frutex 3-metralis, ramis gracilibus ochraceis rugulosis subteretibus dense minutissime puberulis, internodiis brevibus; stipulae persistentes extus densissime scaberulae in vaginam crassam 2.5–3 mm. longam connatae, vagina subtruncata in lobos 4 erectos triangulari-subulatos vix ultra 1 mm. longos desinente; folia inter minora petiolata firme membranacea, petiolo gracili 6–12 mm. longo scaberulo; lamina lanceolato-oblonga vel anguste elliptico-oblonga 7–11 cm. longa 2–3.5 cm. lata longe anguste attenuato-acuminata, basin versus longe anguste attenuata, supra in sicco fusco-olivacea glabra sublucida, nervis manifestis sed vix prominulis, subtus fere concolor, primo densiuscule puberula, serius costa nervisque exceptis fere glabra, costa gracili prominente, nervis lateralibus utroque latere

ca. 16 angulo latiusculo adscendentibus arcuatis juxta marginem arcuato-conjunctis; inflorescentia terminalis 2 cm. longe pedunculata erecta paniculata ca. 6 cm. longa atque aequilata laxe multiflora, floribus in cymulas trifloras dispositis arcte sessilibus, ramis gracilibus densissime minute puberulis omnibus basi bracteatis, bracteis patentibus lineari-filiformibus usque 4 mm. longis persistentibus; hypanthium ca. 0.5 mm. longum puberulum, calyce lato vix 1 mm. longo extus sparse minutissime puberulo remote obscure dentato; corolla alba 9 mm. longa extus dense minute puberula, tubo crassiusculo sursum paullo dilatato, lobis ovali-oblongis vel triangulari-oblongis tubo duplo brevioribus apice rotundatis vel obtusis, fauce non barbato, corolla in alabastro apice rotundata; antherae lineares 4 mm. longae subexsertae.—Colombia: Chapón region, State of Boyacá, in semi-open forest, 1,150 meters, May 7, 1932, *A. E. Lawrance 11* (type in Herb. Field Mus.; duplicate in U. S. Nat. Herb.).

Psychotria Lawrancei Standl., sp. nov.—Frutex 2–2.5 m. altus, ramis crassiusculis teretibus, novellis viridibus sparsissime minute puberulis vel glabris, internodiis abbreviatis; stipulae persistentes et incrassatae in vaginam ca. 3 mm. longam glabram connatae, vagina apice fere truncata sed in lobulos 4 brevissimos desinente; folia modica breviter petiolata membranacea, petiolo crassiusculo vulgo 6–8 mm. longo glabro; lamina oblongo-oblanceolata 10–18 cm. longa 3–6 cm. lata anguste acuminata, basin versus longe anguste attenuata et decurrens, supra in sicco fusco-viridis sublucida glabra, nervis manifestis sed vix prominulis, subrugulosa, subtus fere concolor glabra, costa prominente gracili, nervis lateralibus utroque latere ca. 11 angulo latiusculo adscendentibus arcuatis gracillimis prominulis juxta marginem arcuato-conjunctis; inflorescentia terminalis erecta cymoso-paniculata ca. 4 cm. longa atque 3 cm. lata, ramis primariis basi ebracteatis sparse minute puberulis, inferioribus basi incrassatis plus minusve reflexis, apicibus ramorum quoque incrassatis, floribus parvis sessilibus aggregatis; hypanthium cylindraceum 1 mm. longum glabrum, calyce fere aequilongo campanulato truncato vel remote obsolete denticulato; corolla ochroleuca extus glabra, tubo crasso fere campanulato 2 mm. longo ubique aequilato, lobis late ovatis apice late obtusis reflexis tubo multo brevioribus intus glabratis, fauce albo-barbato; antherae exsertae oblongae 0.8 mm. longae.—Colombia: Region of El Humbo, State of Boyacá, in high forest on steep banks, 1,050 meters, May 6, 1933, *A. E. Lawrance 788* (type in Herb. Field Mus.).

Psychotria limonensis Krause, var. **angustifolia** Standl., var. nov.—A forma typica speciei non differt nisi foliis multo angustioribus, lamina anguste oblongo-oblanceolata 19–26 cm. longa 4–5.5 cm. lata longe anguste acuminata, basin versus longe sensim attenuata.—Guatemala: Finca Moca, Dept. Suchitepéquez, in forest, 1,020 meters, January 7, 1935, *Alexander F. Skutch 2073* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

"A shrub 4.5 meters high; flowers white; berries red."

Psychotria Recordiana Standl., sp. nov.—Arbuscula 4-metralis ut videtur dense ramosa, ramis gracillimis teretibus ochraceis, novellis viridibus dense minutissime puberulis, internodiis brevibus; stipulae persistentes in vaginam subinflatam extus dense puberulam 3–4 mm. longam connatae, vagina in lobos 4 erectos approximatos lineari-attenuatos 4–5 mm. longos desinente; folia parva petiolata membranacea, petiolo gracili 5–8 mm. longo minute puberulo vel subglabro; lamina lanceolata vel oblongo-lanceolata 5.5–11.5 cm. longa 1.5–3 cm. lata, longissime angustissime attenuato-acuminata, basi acuta, supra in sicco laete viridis ad costam prominentem breviter pilosula, aliter glabra, nervis vix prominulis, subtus paullo pallidior sparse minutissime patenti-pilosula vel glabrata, costa gracillima prominente, nervis lateralibus utroque latere ca. 15, nervo altero teneriore parallelo inter paria inserto, angulo fere recto divergentibus arcuatis juxta marginem arcuato-conjunctis; inflorescentiae terminales paniculatae erectae laxe multiflorae graciliter 1.5–4.5 cm. longe pedunculatae 3–7 cm. longae et aequilatae basi trichotomae, ramis gracillimis densiuscule minute puberulis omnibus basi bracteatis, infimis patulis vel subreflexis, bracteis primariis lanceolato-subulatis vel lineari-subulatis usque 1 cm. longis, superioribus oblongis viridibus majusculis flores fere occultantibus, floribus sessilibus aggregatis interdum subcapitellatis; hypanthium minute puberulum; calyx 1.5 mm. longus ad medium dentatus, dentibus obtusis erectis extus puberulis; corolla 5–6 mm. longa, tubo cylindraceo extus glabro, lobis oblongis obtusis extus puberulis tubo duplo brevioribus; fructus juvenilis dense puberulus.—Ecuador: Western cordillera of Quito, valley of Río Salaya, 1,800 meters, October, *A. Rimbach 623* (type in Herb. Field Mus.).

"A small tree 4 meters high, in shade of forest. Flower 12 mm. long, 7 mm. wide; corolla white; calyx colorless; stamens 5; style 3 mm. long, the stigma 2-lobate. Wood whitish. Bark light brown, rather smooth." The species is named for Professor Samuel J. Record, from whom the collection containing this plant was received.

Psychotria Skutchii Standl., sp. nov.—Frutex gracilis 2.5 m. altus, ramis teretibus, novellis viridibus densissime pilis brevibus patentibus sordidis pilosulis, internodiis brevibus; stipulae persistentes in vaginam truncatam 1.5 mm. longam dense puberulam connatae, vagina in lobos 4 aequilongos triangulari-subulatos erectos remotos desinente; folia parva longiuscule petiolata membranacea, petiolo gracili 7–15 mm. longo densissime patenti-pilosulo; lamina anguste elliptico-oblonga vel oblanceolato-oblonga 5.5–9.5 cm. longa 2–3 cm. lata longiacuminata, basin acutam vel acuminatam versus sensim angustata, supra in sicco laete viridis ubique dense puberula et ad costam patenti-pilosula, nervis conspicuis prominulis, subtus paullo pallidior dense molliter patenti-pilosula, costa gracili prominente, nervis lateralibus utroque latere ca. 13 tenerrimis angulo lato adscendentibus arcuatis prominulis juxta marginem arcuato-conjunctis; inflorescentia terminalis erecta sessilis vel ad 3.5 cm. longe graciliter pedunculata cymoso-paniculata 2.5–4.5 cm. longa et aequilata, basi trichotoma, ramis patentibus vel subreflexis omnibus basi bracteatis, bracteis patentibus lineari-attenuatis ad 5 mm. longis puberulis, ramis densissime patenti-pilosulis, bracteis superioribus minutis filiformibus, floribus cymulosis sessilibus vel brevissime crasse pedicellatis; hypanthium ut calyx densissime pilosulum vix 1 mm. longum, calyce ad 1 mm. longo inaequaliter dentato, dentibus triangularibus acutiusculis; corolla alba in alabastro apice late rotundata breviter patenti-pilosula, tubo cylindraceo 6–7 mm. longo fauce parum dilatato non barbato, lobis triangulari-oblongis obtusis ut videtur patentibus intus glabris; antherae semiexsertae; stylus lobos corollae aequans.—Guatemala: Oak woods, San Juan Ixcoy, Dept. Huehuetenango, 2,400 meters, August 22, 1934, *Alexander F. Skutch 1074* (type in Herb. Field Mus.; duplicate in herb. Arnold Arb.).

Tocoyena hispidula Standl., sp. nov.—Ramuli crassiusculi subteretes ferruginei dense vel sparse hispiduli, internodiis brevibus striatis; stipulae persistentes triangulares 5–6 mm. longae acuminatae glabrae; folia mediocria brevissime petiolata crasse membranacea, petiolo crasso ad 6 mm. longo; lamina elliptica vel oblongo-elliptica 11–16 cm. longa 5.5–8 cm. lata ut videtur breviter acuminata, basi acuta vel abrupte acuta, utrinque sat dense hispidula, opaca, costa gracili subtus elevata, nervis lateralibus utroque latere ca. 10 angulo latiusculo adscendentibus arcuatis teneris; flores numerosi apice rami dense capitato-aggregati sessiles vel subsessiles glabri, hypanthio turbinato vix 5 mm. longo, calyce brevi 3 mm. lato remote inconspicue acute dentato; corollae tubus gracillimus 8.5–9 cm. longus teres ca. 2 mm. crassus, alabastris ovoideis acutiusculis, lobis ovato-oblongis ca. 13 mm. longis acutis vel acutiusculis; antherae semiexsertae.—Brazil: Rio Marapy, serrotes, campos, May 15, 1903, *A. Ducke 3574* (type in herb. Mus. Paraensis; fragment in Herb. Field Mus.). Montealegre, Alto da Serra Itauajury, rochedos no campo, April 25, 1916, *Ducke 16078b.*

In Schumann's key to species of *Tocoyena* in *Flora Brasiliensis* this plant would run at once to *T. bullata* Mart., a species that differs in having conspicuously bullate leaves, and in most of its other characters.

COMPOSITAE

Dyssodia puberula (Rydb.) Standl., comb. nov. *Thymophylla puberula* Rydb. N. Amer. Fl. 34: 177. 1915.

BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

VOLUME XVII NUMBER 4

A CONTRIBUTION
TO THE
FLORA OF HONDURAS

BY

T. G. YUNCKER
PROFESSOR OF BOTANY, DEPAUW UNIVERSITY

B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BO
EDITOR

PUBLICATION 405

CHICAGO, U.S.A.
JANUARY 31, 1938

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM

LIST OF PLATES

I. Typical view along the road in the interior of Honduras.
II. *a.* View of Siguatepeque, Honduras; *b.* Hand-sawing pine logs into boards for use in local construction.
III. *Lycopodium arcanum* Maxon. Type specimen.
IV. *Anthurium basiattenuatum* Standley. Type specimen.
V. *Anthurium lucens* Standley. Type specimen.
VI. *Anthurium Yunckeri* Standley. Type specimen.
VII. *Thecophyllum montanum* L. B. Smith. Type specimen.
VIII. *Tillandsia glossophylla* L. B. Smith. Type specimen.
IX. *Tillandsia lampropoda* L. B. Smith. Type specimen.
X. *Tillandsia Yunckeri* L. B. Smith. Type specimen.
XI. *Piper faviculiferum* Trelease. Type specimen.
XII. *Calliandra arborea* Standley. Type specimen.
XIII. *Desmodium luteolum* Standley. Type specimen.
XIV. *Ilex hondurensis* Standley. Type specimen.
XV. *Begonia Yunckeri* Standley. Type specimen.
XVI. *Achyrocline Yunckeri* Blake. Type specimen.
XVII. *Verbesina vicina* Blake. Type specimen.
XVIII. *Zexmenia perymenioides* Blake. Type specimen.

vicinity of Lake Yojoa. From June to the middle of August, 1936, with the assistance of Ray Dawson and Howard Youse, collections were made about the village of Siguateqepue and adjacent mountains in the Department of Comayagua. Siguatepeque was selected as the base from which to do our collecting mainly at the suggestion of Standley, who believed that many species new to science would be found in the mountains near there, and also because the climate and living conditions at that altitude are generally agreeable. The period of our visit coincided with the rainy season, but the rainfall was not sufficiently heavy to interfere greatly with our work. It is believed that a fairly representative collection of those plants in collectable condition during the period of our stay was obtained. Many plants both herbaceous and woody, especially numbers of orchids and bromeliads, were in neither flower nor fruit, and a period of collecting later in the season would undoubtedly yield a large number of additional species.

To reach the interior of the country one ordinarily lands at Puerto Cortés on the north coast. The fastest and most comfortable means of travel in the country is by airplane. The only other way of reaching the interior is to go by train to the inland terminus of the railroad at Potrerillos and then by motor-bus over a road indescribably poor.[1] The road goes by way of the beautiful Lake Yojoa, across which one must ferry. If one can overlook the annoyances occasioned by the poor condition of the road, the journey is of considerable interest, especially to a botanist, because of the great variety of vegetation through which one passes.

Siguatepeque is a quaint town of low, white-washed, Spanish-type adobe houses with weathered, red tile roofs, situated at 1,100 meters altitude near the eastern edge of a small, more or less circular plain. This plain, which is somewhat uneven and has occasional rocky outcroppings, is surrounded by mountains which to the southwest rise to an altitude of 2,000 or more meters. It is drained by exceedingly crooked streams which during the rainy season carry large amounts of water from the mountain slopes and have in many places cut gorges several feet in depth like miniature grand canyons.

When there is sufficient rain, the plain is covered with abundant short grass which affords excellent pasturage for considerable numbers of cattle, mules, and horses. Scattered here and there are farm houses with gardens and small plantations of bananas and corn, but in the main the plain is devoted to the grazing of stock. During the rainy season numerous species of small herbaceous flowering plants, weedy and otherwise, are very abundant in the grassland. Scattered trees and a few small, shrubby species such as *Psidium*, *Lantana*, and *Acacia* occur in neglected pastures, marshy areas, and along occasional fence rows. Generally speaking, however, large woody plants are not abundant except as planted about dwellings or along the stream courses where a considerable number of woody as well as herbaceous species grow well. During the dry season, which ordinarily occurs between January and April, the soil is said to become very dry and powdery and to be blown about in clouds by any slight breeze. During this period the grass also dries up, and it becomes necessary to drive the stock to meadows at higher altitudes in the surrounding mountains to secure sufficient pasturage. Here and there on the plain small, marshlike areas are found where during the wet season occur many grasses, sedges, and other marsh species.

---

[1] Standley gives an interesting description of his journey over this road (Jour. Arn. Arb. 9:15. 1930). Our own experiences convince us that his comments are not exaggerations.

Rising from the edge of the plain and extending to 1,300 or 1,400 meters altitude is a range of more or less rocky foothills forested with a well-marked zone of *Pinus oocarpa* Schiede. The trees in this zone are almost exclusively coniferous with occasional deciduous trees or in some places are mixed with considerable numbers of oak. The stand is open and parklike, and to ascend through it, especially in early morning, is a delightful experience. The pines are mostly fine, tall, straight specimens occasionally reaching a diameter of a meter or more. During the wet season the forest floor is carpeted with various species of flowering plants and short grasses which provide excellent pasturage to large numbers of animals. It is reported that in the dry season this region is burned over each year, which, it is claimed, serves to destroy certain insect pests of the cattle and keep undershrubs from becoming established. This annual burning, together with the intensive grazing which is practiced, prevents any natural reforestration. Few young trees were observed and some of the old trees have succumbed to repeated fire wounds. The trees produce a good grade of timber which is used to a limited extent locally for corner posts, beams, etc. in construction of the adobe houses characteristic of the region. A small sawmill runs when required, though much of the material is cut on location by hand. The log is placed on a scaffolding, and one operator pulls the saw from beneath while another stands on the log. A small amount of resin which is distilled and used locally is collected from the trees.

Originally a dense growth of deciduous forest extended from the upper limits of the pine zone to the summit of the principal mountain range. Much of the original forest has been destroyed, however, and at the present time, between the lower pine-clad ridges and the main range capped with deciduous virgin forest, lie gently to steeply sloping pastures and cornfields cut here and there with deep, steep-sided ravines through which swiftly descending mountain streams dash over rocks as steep cataracts. In these gorges, densely shaded by overhanging tree tops and wet with the spray of waterfalls, one finds the original vegetation surviving. Giant tree ferns, Heliconias, arums, bromeliads, orchids, and many other herbaceous and woody species grow in great profusion to produce a dense entanglement through which one often needs to cut one's way. In this intermediate zone one also discovers occasional subalpine boggy areas exhibiting characteristic and interesting species.

This intermediate cleared zone, fringed principally with pine and scrub oak at the lower edge, gives way to the more steeply rising ridges and gulches of the highest range of peaks still covered for the most part with deciduous forest. Each year sees additional areas being fired and cleared for planting, with the result that in a comparatively short time most of the original deciduous forest as well as the lower pine belt will have been destroyed, with the original vegetation surviving only on the highest and steepest mountain peaks and in ravines unsuited for agricultural purposes. Such deforestation will likely bring about extensive erosion and serious destruction of land now useful for agricultural purposes, as well as have an effect on the rainfall.

In the forest at the summit giant, smooth-barked trees with wide buttresses predominate. Their tops, which often meet far overhead to produce a canopy through which the sun rarely penetrates, carry great numbers of epiphytes on their branches. These ordinarily are accessible to collectors only when a branch breaks off in a storm because of the excessive load which it carries. The understory is made up of many species of small trees, shrubs, palms, arums, lianas, etc., which often form an entanglement of considerable density, or in some places the forest may be more open. The forest floor is overspread with deep, damp humus, rotting logs, and entangled brush and vines. The logs and tree trunks are covered with ferns, Peperomias, arums, and other low or creeping plants forming a matted growth with numerous species of mosses, liverworts, and lichens.

The list of plants presented in this paper includes, in addition to the plants collected about Siguatepeque in 1936, those obtained in 1934 about Potrerillos and Lake Yojoa. Included also are those species found in the Lancetilla-Tela region not previously reported by Standley in his *Flora*. A list of over one hundred species cultivated in and about Siguatepeque is not included, and a number of common garden and street weeds observed about the village is also omitted.

In the list those species collected on the plains about Siguatepeque are commonly cited without any indication of locality. El Achote, given as the station for many species, is an area in the mountains near the upper edge of the pine forest belt at about 1,350 meters altitude. The summit of the range above El Achote, which is frequently enveloped in clouds, rises to an altitude of about 2,000 meters. El Rincón is a region about 12 kilometers west of Siguatepeque at the edge of the summit forest about 1,400 to 1,500 meters altitude.

In the preparation of this list I have become greatly indebted to the following specialists who have assisted by identifying and verifying specimens as well as generously allowing the inclusion of the descriptions of new species which were discovered: Mr. A. H. G. Alston (*Selaginella*); Prof. Oakes Ames (Orchidaceae); Mr. E. B. Bartram (Musci); Dr. S. F. Blake (Compositae); Mrs. Agnes Chase (Gramineae); Dr. C. W. Dodge (lichens, excluding *Cladonia*); Prof. A. W. Evans (*Cladonia*); Mr. E. P. Killip (Passifloraceae); Mr. E. C. Leonard (Acanthaceae); Dr. W. R. Maxon (Pteridophyta); Mr. C. V. Morton (Smilacaceae and Gesneriaceae); Dr. L. B. Smith (Bromeliaceae); Dr. William Trelease (Piperaceae, *Phoradendron*, and *Quercus*). I am especially indebted to Mr. Paul C. Standley, who not only identified or verified most of the remaining numbers and contributed critical notes to many species as well as the descriptions of several new species, but who also gave much helpful advice and information about the country and the conditions prevailing there. To Messrs. Ray Dawson and Howard Youse who assisted me on the 1936 expedition I wish to express my sincere appreciation. One could not wish for more capable assistants and more cheerful companions. I am also grateful to Dr. Wilson Popenoe and other officials of the United Fruit Company who freely gave advice and assistance whenever possible.

An almost complete set of the specimens upon which this paper is based is deposited in the Herbarium of Field Museum.

LIST OF GENERA AND SPECIES

LICHENES

CHIODECTONACEAE

CHIODECTON Ach.

Chiodecton sanguineum (Sw.) Vainio. On tree trunk at El Achote.

PANNARIACEAE

COCCOCARPIA Pers.

Coccocarpia cronia var. isidiophylla (M. A.) Dodge. On tree trunk.

PANNARIA Del.

Pannaria lurida (Mont.) Nyl. On tree trunk, summit of the range above El Achote.

STICTACEAE

LOBARIA (Schreb.) Hue

Lobaria conformis Vainio. On tree trunk near El Achote.

STICTA Schreb.

Sticta clathrata Dutr. On tree trunk.

Sticta laciniata (Sw.) Ach. On log, near the summit of the range above El Achote.

Sticta Pickeringii Tuck. On tree trunk.

STICTINA (Nyl.) Hue

Stictina carpoloma (Del.) Nyl. On tree trunk near the summit of the range above El Achote.

PELTIGERACEAE

PELTIGERA Willd.

Peltigera polydactyla (Neck.) Hoffm. On a moist bank in a ravine near El Achote.

CLADONIACEAE

CLADONIA Hill

Cladonia chlorophaea (Floerke) Spreng. Wet soil, river bank.

Cladonia corymbulosa Nyl. On rotten log, ravine at El Achote.

Cladonia cristatella Tuck. On fence slats.

Cladonia didyma (Fée) Vainio. On log near El Achote.

Cladonia fimbriata (L.) Fries. On log near El Achote.

Cladonia fimbriata var. **Balfourii** (Cromb.) Vainio. On a tree trunk near El Achote.

Cladonia fimbriata var. **chondroidea** Vainio. On soil.

Cladonia Floerkeana (Fries) Sommerf. On tree trunk.

Cladonia furcata var. **pinnata** (Floerke) Vainio, f. *truncata*. On log, top of the range above El Achote.

Cladonia pityrea (Floerke) Fries. On tree trunk near El Achote.

Cladonia subcariosa Nyl. On dry soil.

PARMELIACEAE

PARMELIA Ach.

Parmelia americana Mey. & Flot. On log near the summit of the range above El Achote.

Parmelia capitata Lynge. On fence pickets.

Parmelia cristifera Tayl. On tree trunk.

Parmelia latissima Fée. On fence post.

Parmelia pseudoflavescens Zahlbr. On fence pickets.

Parmelia subrugata Nyl. On tree trunk near El Achote.

Parmelia tinctorum Despr. On fence slat.

USNEACEAE

RAMALINA Ach.

Ramalina alludens Nyl. On tree trunk near El Achote.

Ramalina attenuata Pers. On tree trunk.

Ramalina yemensis (Ach.) Nyl. On tree trunk.

PHYSCIACEAE

ANAPTYCHIA Koerb.

Anaptychia leucomelaena (L.) Vainio. On fence post.

Anaptychia leucomelaena var. **albociliata** Nyl. On tree trunk.

Anaptychia podocarpa var. **conferta** Vainio. On tree trunk.

PHYSCIA Ach.

Physcia segilata (Ach.) Nyl. On tree trunk.

Physcia syncolla Tuck. On tree trunk.

MUSCI

FISSIDENTACEAE

FISSIDENS Hedw.

Fissidens reclinatulus C. M. On moist bank, ravine near El Achote.

LEUCOBRYACEAE

OCTOBLEPHARUM Hedw.

Octoblepharum albidum Hedw. On rotten log near El Achote.

POTTIACEAE

GLOBULINA C. Muell.

Globulina globulifera (Hpe.) C. M. New for Honduras. On a dry bank, plains east of Siguatepeque.

FUNARIACEAE

FUNARIA Schreb.

Funaria calvescens Schwaegr. On soil.

BRYACEAE

BRYUM Dill.

Bryum andicola Hook. On moist bank, in a ravine near El Achote.

Bryum argenteum Hedw. var. **lanatum** Bry. Eur. On rotten log.

BARTRAMIACEAE

PHILONOTIS Bridel

Philonotis tenella (C. M.) Besch. On moist bank.

ORTHOTRICHACEAE

MACROMITRIUM Bridel

Macromitrium longifolium (Hook.) Brid. New for Honduras. On a rotten log near El Achote.

Macromitrium mucronifolium (Hook. & Grev.) Schwaegr. On tree trunk.

Macromitrium Podocarpi C. M. On log near El Achote.

Macromitrium Sumichrasti Dub. New to Honduras. On a tree trunk near El Achote.

MICROMITRIUM Aust.

Micromitrium fragile (Mitt.) Jaeg. On log.

SCHLOTHEIMIA Brid.

Schlotheimia Mohriana C. M. On bank of stream.

Schlotheimia Sartorii C. M. On tree trunk.

RHACOPILACEAE

RHACOPILUM P. de Beauv.

Rhacopilum tomentosum (Hedw.) Brid. On wet bank.

RHIZOGONIACEAE

RHIZOGONIUM Bridel

Rhizogonium spiniforme (Hedw.) Bruch. On a rotten log near El Achote.

METEORIACEAE

PAPILLARIA (C. Muell.) C. Muell.

Papillaria nigrescens (Sw.) Jaeg. On tree trunk.

FABRONIACEAE

FABRONIA Raddi

Fabronia flavinervis C. M. On fence rails and tree trunks.

THUIDIACEAE

RAUIA Aust.

Rauia subcatenulata (Schp.) Broth. On tree trunk.

THUIDIUM B. & S.

Thuidium delicatulum (Hedw.) Mitt. On a log, summit of the range above El Achote.

ENTODONTACEAE

ERYTHRODONTIUM Hamp.

Erythrodontium longisetum (Hook.) Par. On tree trunk.

SEMATOPHYLLACEAE

RHAPHIDORRHYNCHIUM Besch.

Rhaphidorrhynchium Lindigii (Hpe.) Broth. On log.

SEMATOPHYLLUM Mitten

Sematophyllum caespitosum (Hedw.) Mitt. Common on soil.

Sematophyllum cuspidiferum Mitt. New to Honduras. On rock.

Sematophyllum galipense (C. M.) Mitt. On tree trunk.

HYPNACEAE

MITTENOTHAMNIUM Hennings

Mittenothamnium diminutivum (Hpe.) E. G. Britt. On wet banks and rotten logs.

Mittenothamnium Lehmanii Besch. On tree trunk.

ISOPTERYGIUM Mitten

Isopterygium tenerum (Sw.) Mitt. On rotten log.

CTENIDIUM (Schimp.) Mitten

Ctenidium hondurense Edwin B. Bartram, sp. nov.—*C. mollusco* (Hedw.) Mitt. forsan proximum, differt foliis breviter acuminatis, fortiter plicatis, tenuibus denticulatis.

Probably dioicous, male flowers not seen. Rather robust, soft, laxly tufted plants, green with a tinge of brown, slightly glossy. Stems irregularly pinnately branched. Leaves crowded, strongly falcate-secund with circinate tips; stem leaves up to 1.5 mm. long and 0.7 mm. wide, lanceolate from an auriculate, broadly cordate base, slightly decurrent, short-acuminate, deeply plicate, denticulate all around; costa double, well defined, extending about one-third of the way up the leaf; cells linear with rounded ends, 3–4μ wide and 8–12 times as long, with firm walls, shorter and irregularly rectangular at the basal angles and across the leaf insertion; branch leaves slightly smaller, from an oblong-ovate, scarcely cordate base, short-acuminate, strongly plicate. Perichaetium large; inner perichaetial leaves erect, ecostate, not plicate, up to 4.5 mm. long, gradually narrowed to a long, filiform, slightly denticulate point; seta 12 mm. long; capsule horizontal, oblong, about 2 mm. long. Peristome, lid, and calyptra unknown.

HONDURAS: On a log near El Rincón, about 10 miles west of Siguatepeque, 1,400–1,500 meters altitude, Department of Comayagua, July 24, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6608.*

While evidently near *C. molluscum*, this species differs in several noteworthy particulars. Both the stem and branch leaves are rather broadly short-acuminate and very strongly plicate; the costa is well developed with the forks extending some distance up the leaf, and the perichaetium is large and conspicuous.

POLYTRICHACEAE

ATRICHUM Beauv.

Atrichum angustatum (Brid.) Bry. Eur. var. **Mulleri** (Schp.) Bartr. On soil.

OPHIOGLOSSACEAE

OPHIOGLOSSUM L.

Ophioglossum crotalophoroides Walt. On a moss-covered rock in a wet ravine near El Achote.

Ophioglossum reticulatum L. Rich soil, river bank, about 6 kilometers west of Siguatepeque.

MARATTIACEAE

MARATTIA Sw.

Marattia excavata Underw.? In forest, summit of the range above El Achote.

OSMUNDACEAE

OSMUNDA L.

Osmunda cinnamomea L. (form). Subalpine bog near El Achote.

Osmunda regalis L. Subalpine bog near El Achote.

SCHIZAEACEAE

ANEMIA Sw.

Anemia adiantifolia (L.) Sw. On a rocky cliff near Potrerillos.

Anemia humilis (Cav.) Sw. On a rocky cliff in pine forest.

Anemia pastinacaria Moritz. In wet soil, pine forest.

Anemia Phyllitidis (L.) Sw. Terrestrial, wet ravine near El Achote.

LYGODIUM Sw.

Lygodium polymorphum (Cav.) HBK. Climbing in a thicket near Potrerillos.

GLEICHENIACEAE

DICRANOPTERIS Bernh.

Dicranopteris pectinata (Willd.) Underw. Scrambling over shrubs in thicket on river bank in pine forest.

HYMENOPHYLLACEAE

HYMENOPHYLLUM J. E. Sm.

Hymenophyllum asplenoides Sw. On a tree in forest at the summit of the range above El Achote.

Hymenophyllum fucoides Sw. On a tree in forest at the summit of the range above El Achote.

Hymenophyllum polyanthos Sw. On a tree in forest at the summit of the range above El Achote; also on trees and logs in a wet ravine near El Achote.

TRICHOMANES L.

Trichomanes capillaceum L. On a tree in forest at the summit of the range above El Achote.

Trichomanes montanum Hook. On a tree in forest at the summit of the range above El Achote.

Trichomanes radicans Sw. var. On a tree in forest at the summit of the range above El Achote.

Trichomanes rigidum Sw. On side of a wet ravine near El Rincón.

DICKSONIACEAE

CIBOTIUM Kaulf.

Cibotium regale Versch. & Lem. Leaves up to 2 meters in length, the base covered with abundant, golden-brown hairs. Bottom of a dark, wet ravine near El Achote.

CYATHEACEAE

ALSOPHILA R. Br.

Alsophila mexicana Mart. Trunk up to 4.5 meters tall and 12–14 cm. in diameter. Leaves 2–3 meters in length, the base covered with thin, brown scales. In forest at the summit of the range above El Achote.

Alsophila Schiedeana Presl. Trunk about 2 meters tall and 10–15 cm. in diameter. In forest at the summit of the range above El Achote; also in a wet ravine near El Rincón.

CYATHEA Sm.

Cyathea mexicana Schlecht. & Cham. Trunk about 2 meters tall. Leaves up to 2 meters in length, armed and with narrow, brown scales at the base. In spray of waterfalls, bottom of a wet ravine near El Achote.

HEMITELIA R. Br.

Hemitelia costaricensis (Klotzsch) Mett. Trunk about 1 meter tall and 7 cm. in diameter. In a dry gulch, hills east of Siguatepeque.

POLYPODIACEAE

ACROSTICHUM L.

Acrostichum daneaefolium Langsd. & Fisch. In water, edge of a marsh near Tela.

ADIANTOPSIS Fée

Adiantopsis radiata (L.) Fée. On a wet cliff, river bank.

ADIANTUM L.

Adiantum concinnum H. & B. On a wet cliff in a ravine near El Achote.

Adiantum tenerum Sw. In crevices of a rocky cliff near Potrerillos.

Adiantum trapezoides Fée. In a wet ravine near El Achote.

ASPLENIUM L.

Asplenium auritum Sw. On a tree near the shore of Lake Yojoa; also in a wet ravine near El Achote.

Asplenium cristatum Lam. Bottom of a wet ravine near El Achote.

Asplenium formosum Willd. On a tree near the shore of Lake Yojoa.

Asplenium miradorense Liebm. On a rotten log in forest at the summit of the range above El Achote.

Asplenium praemorsum Sw. On a tree, river bank.

Asplenium radicans L. var. **partitum** (Klotzsch) Hieron. Terrestrial. In a wet ravine near El Achote.

Asplenium serra Langsd. & Fisch. On a log in deep forest near the summit of the range above El Achote.

Asplenium serratum L. On a tree near the shore of Lake Yojoa.

BLECHNUM L.

Blechnum occidentale L. In a wet ravine near El Achote.

Blechnum unilaterale Sw. Rock hillside, beneath pine trees.

CHEILANTHES Sw.

Cheilanthes angustifolia HBK. In wet soil in pine forest, above the plains of Siguatepeque.

DENNSTAEDTIA Bernh.

Dennstaedtia globulifera (Poir.) Hieron. On a wet cliff, ravine near El Achote.

Dennstaedtia rubiginosa (Kaulf.) Moore. In a forest on a ridge above Lancetilla Valley.

DIDYMOCHLAENA Desv.

Didymochlaena truncatula (Sw.) J. Sm. In a wet ravine near El Rincón.

DIPLAZIUM Sw.

Diplazium Donnell-Smithii Christ. In a wet, shady ravine near El Achote.

DRYOPTERIS Adans.

Dryopteris denticulata (Sw.) Kuntze. In cloud-zone forest at the summit of the range above El Achote.

Dryopteris effusa var. **divergens** (Willd.) Hieron. In a ravine near El Achote.

Dryopteris Hemsleyana (Baker) C. Chr. In cloud-zone forest at the summit of the range above El Achote.

Dryopteris interjecta C. Chr. In a wet ravine near El Achote.

Dryopteris Linkiana (Presl) Maxon. In a wet ravine near El Achote.

Dryopteris melanochlaena C. Chr. In a wet ravine near El Achote.

Dryopteris nicaraguensis (Fourn.) C. Chr. Bottom of a wet ravine near El Achote.

Dryopteris normalis C. Chr. Side of a ravine near El Achote.

Dryopteris oligocarpa (H. & B.) Kuntze. In a subalpine bog near El Achote.

Dryopteris patula (Sw.) Underw. On rocky hillsides near El Achote.

Dryopteris pseudosancta C. Chr. On river bank.

Dryopteris resiliens Maxon, sp. nov.—Sect. *Goniopteris.* Certe *D. paucijugae* proxima, a qua differt: rhizomatis paleis fere glabris; lamina ambitu late lanceolata; pinnis multijugis profundius pinnatifidis, superioribus gradatim minoribus sed conformibus et sessilibus, laminae apice breviter acuminato paucilobato; segmentis longioribus et plerumque falcatis, nunquam truncatis; segmentorum majorum venis 10–13-jugis, basalibus non conniventibus; soris indusiis fulvis nec fusco-vinaceis praeditis; parenchymate membranacea et verruculosa, nec herbacea et laevi.

Rhizome horizontal or creeping, woody, 5–8 cm. long, about 1 cm. thick, bearing numerous stout roots throughout, obscurely paleaceous at apex, the scales very few, cucullate, coherent, subovate, 3–5 mm. long, yellowish brown, thin, entire, nearly glabrous. Fronds 4–10, subfasciculate, 40–70 cm. long, arching, the stipes about as long as the blades, slender, dull stramineous, with a thin covering of minute, stalked, stellate hairs; blades 20–35 cm. long, 12–20 cm. broad, lanceolate to lanceovate, pinnate nearly throughout, only the short, abruptly acuminate apex pinnately lobed; pinnae numerous (15–19-jugate), sessile, the 2 or 3 lowermost pairs sharply deflexed, these the largest, 8–12 cm. long, 1.5–3 cm. broad, lance-attenuate, obliquely pinnatifid two-thirds the distance to the costa or more, inequilateral at base, subauriculate, the distal segment often nearly free, the segments in general mostly oblong or linear-oblong, falcate or subfalcate, 4–5 mm. broad at base, distally acutish; other pinnae narrowly oblong, mostly from a slightly broader base, the upper ones gradually smaller but conform, one or more often viviparous at base; costae and costulae minutely puberulous beneath, the hairs both simple and stellate; veins of larger segments 10–13 pairs, distant, oblique, elevated, glabrate, simple or a few of the distal ones acutely forked midway to the margin, the arcuate basal ones running out nearly or quite to the sinus but never connivent; sori medial, small, distant; indusia yellowish brown, firm, rigidly ciliolate, persistent. Leaf tissue membranous, grayish green, verruculose throughout.

Type in the U. S. National Herbarium, No. 1,309,047, collected in Lancetilla Valley, near Tela, Department of Atlántida, Honduras, altitude 20–600 meters, in wet forest, Dec. 26, 1927 to March 20, 1928, by Paul C. Standley (No. 52,893). Other material at hand is as follows:

HONDURAS: Lancetilla, alt. 20–600 meters, *Yuncker 4609; Standley 52894, 53977, 54578, 54873; Chickering 142; Pauline Ames 52, 61, 74, 77.* Puerto Arturo, near Tela, *Pauline Ames 177.* Near Puerto Castilla, *Pauline Ames 87.* Río Pelo, Cordillera de Mico Quemado, Dept. Yoro, alt. 60–380 meters, *Pauline Ames 135, 138, 139.* Near Ceiba, alt. 120 meters, *Dyer A223.* Río Bermejo, Dept. Santa Bárbara, alt. 180 meters, *J. D. Smith 5698* (leg. *C. Thieme*).

MEXICO: Ixtacomitán, Chiapas, alt. 120 meters, Sept. 27, 1887, *Rovirosa 51.*

Most of this material belongs to recent collections. Of the specimens cited only the last two were seen by Dr. Christensen, and not unnaturally were referred by him to *D. paucijuga* (Kl.) C. Chr., a species properly to be restricted to Tobago, Trinidad, and Venezuela. The relationship is close, yet in the light of recent material *D. paucijuga* may always be distinguished by its relatively broad, subdeltoid blades, which also are gradually narrowed to an elongate, lobate apex, its much fewer and less deeply pinnatifid pinnae, its closer and often truncate segments, its subfuscous indusia, and its smooth, thicker leaf tissue. Moreover, the rhizome scales are easily seen and are conspicuously stellate-pubescent, whereas in *D. resiliens* it is hard to find so much as a single stellate hair upon the scales, which are few, closely packed, and nearly concealed at the apex of the rhizome. Habitally the two species are alike, especially in their several very strongly deflexed basal pinnae. In *D. resiliens* the viviparous condition is more pronounced. A single frond often bears 2 or 3 buds upon the upper rachis, these producing good-sized plants, in one instance a young plant (still attached) of 9 fronds measuring up to 12 or 13 cm. long.

Dryopteris resinifera (Desv.) Weatherby. On rock outcropping.

Dryopteris subincisa (Willd.) Urban. In a wet ravine near El Achote.

ELAPHOGLOSSUM Schott

Elaphoglossum rampans (Baker) Christ. In a wet ravine above El Achote.

Elaphoglossum rubescens (Kuhn) Christ. On a tree in forest near El Achote.

Elaphoglossum scolopendrifolium (Raddi) J. Sm. On a rotten log in forest at the summit of the range above El Achote.

Elaphoglossum tectum (H. & B.) Moore. In a subalpine bog near El Achote.

HECISTOPTERIS J. Smith

Hecistopteris pumila (Spreng.) J. Sm. On a tree in forest above Lancetilla Valley.

HEMIONITIS L.

Hemionitis pinnatifida Baker. In shade, river bank.

LINDSAYA Dryander

Lindsaya quadrangularis Raddi. In a wet ravine near El Rincón.

MAXONIA Christensen

Maxonia apiifolia (Sw.) C. Chr. var. **dualis** (Donn. Sm.) C. Chr. Bottom of ravine near El Achote.

NEPHROLEPIS Schott

Nephrolepis cordifolia (L.) Presl. In a dark, wet ravine near El Achote.

Nephrolepis pendula (Raddi) J. Sm. On a dead tree near the shore of Lake Yojoa.

ODONTOSORIA (Presl) Fée

Odontosoria Schlechtendalii (Presl) C. Chr. Fronds 1–1.5 meters long, arching over a stream in a wet, shady ravine near El Achote.

PITYROGRAMMA Link

Pityrogramma calomelaena (L.) Link. In thicket on river bank.

Pityrogramma Schaffneri (Fée) Weatherby. On river bank in shade.

Pityrogramma tartarea (Cav.) Maxon. On side of a wet ravine near El Achote.

POLYPODIUM L.

Polypodium angustifolium Sw. On a tree along river bank.

Polypodium angustum (H. & B.) Mett. On a tree in wet ravine near El Achote.

Polypodium apiculatum Kunze. On a tree in dense forest at the summit of the range above El Achote. A species of northern South America, previously known otherwise only from Hispaniola.

Polypodium asplenifolium L. On a tree in wet ravine near El Rincón.

Polypodium astrolepis Liebm. On a tree, river bank near Siguatepeque; also on a tree near the shore of Lake Yojoa.

Polypodium carpinterae Rosenstock. In a wet ravine near El Achote; also at El Rincón. Known previously only from Costa Rica.

Polypodium crassifolium L. In a wet ravine near El Achote.

Polypodium cryptocarpon Fée. On a tree near Lake Yojoa.

Polypodium cultratum Willd. On a tree in forest at the summit of the range above El Achote.

Polypodium delitescens Maxon. On a tree in dense forest at the summit of the range above El Achote. New to Honduras; common in the high mountains of Jamaica, and known previously also from Alta Verapaz, Guatemala.

Polypodium dissimile L. On the ground in forest at the summit of the range above El Achote.

Polypodium fraternum Schlecht. & Cham. On a rock in pine forest near El Achote.

Polypodium induens Maxon. On a tree in forest, summit of the range above El Achote.

Polypodium Lindenianum Kunze. On a tree near Lake Yojoa.

Polypodium loriceum L. On a rotten log in forest near the summit of the range above El Achote.

Polypodium montigenum Maxon, sp. nov.—Sect. *Eupolypodium*. Epiphyticum, e turma *P. plebeii,* facie *P. plebeium* ipsum praecipue simulans, a quo differt: rhizomatis paleis admodum obliquis et adpresso-imbricatis, non anguste et crasse atro-carinatis, marginibus pallidis teneris angustioribus et planis numquam complicato-crispis; laminis pinnatis, nec pinnatifidis; stipite et rhachibus non foliaceo-marginatis subpersistente adpresso-paleaceis. Fortasse *P. leucosticto* propius, sed rhizomate longe repente libero paleis non atro-carinatis angustioribus onusto, frondibus distantibus nec fasciculatis, laminis pinnatis nec pinnatifidis, segmentis non dilatatis inter alia sat recedit.

Epiphytic; rhizome rampant, loosely attached by a few distant, wiry roots, largely free, 30–40 cm. long, 3–5 mm. thick, flattish and shallowly sulcate in drying, divaricately branched, persistently paleaceous; scales very oblique, closely appressed-imbricate, lance-subulate, 3–4 mm. long, 1–1.5 mm. broad, dark castaneous, with thin, pale, plane, fimbriate borders, or the underlying ones ovate-attenuate, with broader borders, the scales thus bicolorous, the broad, subopaque, median stripe percurrent. Fronds conform, mostly distant, 20–50 cm. long, straight; stipes mostly a little shorter than the blades, 1–2 mm. thick, bisulcate, dull castaneous, thinly and deciduously appressed-paleaceous; blades mostly 15–30 cm. long, 6–14 cm. broad, imparipinnate, the pale castaneous rachis lightly marginate, deciduously paleaceous; pinnae chartaceo-coriaceous, 10–16 pairs, spreading, straight or subarcuate, adnate (upper ones slightly decurrent), the fertile ones linear, 2–4 times their width apart, mostly 4–7 mm. broad, acutish, the sterile ones closer, broader (7–10 mm., rarely 15 mm. near middle), narrowed toward base, sublanceolate, attenuate toward apex; margins cartilaginous, faintly and remotely notched or, in large, sterile pinnae, sometimes broadly serrulate; veins free, concealed, oblique, twice-forked; pinnae punctate-paleaceous beneath, the scales distant, appressed, 0.5–1 mm. long, long-attenuate from a subtriangular base, light castaneous, with deeply toothed, pale margins; sori 10–16 pairs, uniserial, yellowish brown, globose, large (2–3 mm. in diameter), medial, usually contiguous, often touching both midrib and margin.

Type in the U. S. National Herbarium, No. 1,182,092, collected from a tree trunk at edge of forest, along cart road from Vara Blanca (between Poás and Barba volcanoes) to La Concordia, Costa Rica, alt. 1,600–1,950 meters, July 23, 1923, by William R. Maxon and Alfred D. Harvey (No. 8479). A second specimen of this collection has afforded data regarding the sterile fronds. Additional material examined is as follows:

HONDURAS: Summit of range above El Achote, Dept. Comayagua, alt. 1,800 meters, *Yuncker, Dawson & Youse 6140.*

COSTA RICA: Volcán de Barba, at 2,400–2,800 meters, *M. Valerio 34, A91, 197.* Volcán de Irazú, at 2,300 meters altitude, *Pittier 840;* crater of volcano, *Jiménez 1154* (greatly reduced). Volcán de Turrialba, alt. 2,000–2,500 meters, *Pittier 13257* (*J. D. Smith 7487*); *Standley 35059.* Santa Clara de Cartago, alt. 1,950 meters, *Lankester 743, 901; Maxon & Harvey 8200.* Las Nubes, Prov. San José, alt. 1,500–1,900 meters, *Standley 38781.*

PANAMA: Cordillera above Camp I, Holcomb's Trail, above El Boquete, Prov. Chiriquí, alt. 1,800–2,000 meters, *Killip 5301.*

Habitally *P. montigenum* suggests *P. plebeium* Schlecht. & Cham., but that species is at once distinguished by its pinnatifid blades, its closer and truly dilatate segments, and its shaggy, squarrose-paleaceous rhizomes, upon which the scales are densely packed, broad, with a thick, very narrow, sharply elevated percurrent, black median stripe, and with very broad, pale, ruffled borders. The relationship to *P. leucosticton* Kunze is perhaps somewhat closer, but aside from scale characters, that differs notably in its dimorphic, fasciculate fronds, green-margined stipes, dilatate segments, and short, thick, densely felted-radicose rhizomes.

Polypodium plumula H. & B. On a rotten log in a wet ravine near El Rincón; also at the summit of the range above El Achote.

Polypodium polypodioides (L.) Watt. On a tree in a wet ravine near El Achote.

Polypodium rhodopleuron Kunze. On a tree in a ravine near El Achote.

Polypodium trichomanoides Sw. On a tree in dense forest at the summit of the range above El Achote. New to Honduras; common in the higher mountains of Jamaica, but otherwise known previously only from a single collection from Alta Verapaz, Guatemala.

Polypodium triseriale Sw. On a tree near the summit of the range above El Achote; also on a tree near Lake Yojoa.

POLYSTICHUM Roth

Polystichum platyphyllum (Willd.) Presl. In a wet ravine near El Achote.

PTERIDIUM Scop.

Pteridium aquilinum (L.) Kuhn, var. **Feei** (Schaffn.) Maxon, comb. nov.—*Pteris Feei* Schaffn. ex Fée, Mém. Foug. 8: 73. 1857.

The present form, which was briefly described by Fée from material collected at Huatusco (*Schaffner 138, 141*) and on Popocatepetl (*Schaffner 186*), is represented in the U. S. National Herbarium by the following specimens:

MEXICO: Jalapa, Veracruz, *Pringle 8342*. Córdoba, Veracruz, *Finck 18; Kerber Exsicc. 79a*. Huatusco, Veracruz, *Mohr* in 1857. Guanajuato, *Dugès 6*. Alvarez, San Luis Potosí, *E. Palmer 67* in 1902. Teziutlán, Puebla, *Orcutt 4029*. Between Somoriel and Las Lajas, Hidalgo, *Rose 9204*. Below Ajusco, Mexico, *Rose & Painter 7214*.

GUATEMALA: Laguna de Ayarza, Dept. Jalapa, alt. 2,400 meters, *Heyde & Lux* (*J. D. Smith 4080*). Chichavac, Dept. Chimaltenango, alt. 2,400–2,700 meters, *Skutch 12*. Bananera, Dept. Chimaltenango, *J. R. Johnston 512; Mrs. B. B. Lewis 448*.

HONDURAS: Near Siguatepeque, Dept. Comayagua, alt. 1,050–1,400 meters, *Yuncker, Dawson & Youse 5600, 5781; Standley 56034*.

These agree essentially and are characterized, briefly, by their short, deltoid or broadly pentagonal blades, their extraordinarily copious, pilose-villous, hairy covering (much less pronounced upon the upper surface), their relatively broad and flat outer indusium, and the invariable presence of many long, slender cilia fringing the outer indusium.

Further studies may show this form to be specifically distinct. Its relationship is with the variable *P. aquilinum* var. *lanuginosum* (Bong.) Fernald (Rhodora 37: 247. 1935) of western North America, with which it appears to be connected through two or three transitional specimens from northern Mexico; but that so-called variety, remarkably varied as to shape of blade, has a much narrower outer indusium, which though hairy upon the surface is almost without exception wholly devoid of cilia. In this last respect var. *lanuginosum* differs widely from most European specimens of *P. aquilinum*, in which as a rule the outer indusium is conspicuously long-ciliate, the cilia often reaching nearly to the midrib of the segments (as in var. *Feei*); but even in Europe the cilia are sometimes altogether wanting, though rarely so, and in leaf shape, hairiness, and other characters European specimens show almost as great diversity as is exhibited by American material.

PTERIS L.

Pteris orizabae Mart. & Gal. In forest near the summit of the range above El Achote.

Pteris propinqua Agardh. In deep forest, Lancetilla Valley.

Pteris quadriaurita Retz. In a ravine above El Achote.

RHIPIDOPTERIS Schott

Rhipidopteris peltata (Sw.) Schott. On a tree in forest at the summit of the range above El Achote.

STENOCHLAENA J. Smith

Stenochlaena vestita (Fourn.) Underwood. Climbing on a tree in a wet ravine, El Achote.

STRUTHIOPTERIS Willd.

Struthiopteris polypodioides (Sw.) Trev. On a tree in dense forest near the summit of the range above El Achote.

Struthiopteris varians (Fourn.) Broadh. In a wet ravine near El Achote. Known previously only from Mexico.

TECTARIA Cav.

Tectaria dilacerata (Kunze) Maxon. In a wet ravine near El Achote; also in forest above Lancetilla Valley.

VITTARIA J. E. Sm.

Vittaria dimorpha K. Muell. On a tree in a wet ravine near El Achote.

Vittaria filifolia Fée. On a tree near the shore of Lake Yojoa.

MARSILIACEAE

MARSILEA L.

Marsilea sp. In water about 30 cm. deep in a marsh near Siguatepeque.

LYCOPODIACEAE

LYCOPODIUM L.

Lycopodium arcanum Maxon, sp. nov.—Pl. III. Sect. *Urostachys.* Planta epiphytica, ca. 20 cm. longa et lata; caulis ascendens, quinquies bipartitus, basi 2 mm. diametro, lignosus, angulatus; folia numerosa, 10- vel 12-faria, patentia, plerumque arcuata, acicularia, 10–17 mm. longa, basi 0.5–0.7 mm. lata, sursum angustiora, usque ad apicem subpungentem sensim attenuata, integra, longe decurrentia, sordide viridia, tenero-herbacea, siccitate per longitudinem carinata vel bisulcata latere abaxiali, latere adaxiali profunde concava vel subplicata, interdum ut videtur subtriquetra; sporangia pauca, in parte superiori zonis disposita (sporophyllis conformibus), rotundato-reniformia, 1.5 mm. lata, 1.2 mm. longa.

Plant epiphytic, 20 cm. long and broad, the stem 5 times divaricately bipartite, 2 mm. in diameter at base, about 1 mm. at apex, rigid, not flattened in drying; leaves crowded in attachment, borne in 10 or 12 ranks, acicular, spreading, mostly arcuate, 10–17 mm. long, 0.5–0.7 mm. broad at extreme base, 0.3–0.5 mm. broad below middle when plane, tapering to a subpungent apex, entire, delicately herbaceous, long-decurrent and sharply carinate upon the stem, on the abaxial side carinate throughout or often bisulcate by shrinkage of leaf tissue, on the adaxial side deeply concave or subplicate in drying, the leaf sometimes appearing subtriquetrous; plant sparingly fertile in the apical third, the sporangia borne in short, alternating zones, the sporophylls identical with foliar leaves; sporangia rounded-reniform, 1.5 mm. broad, 1.2 mm. long, with a deep sinus, protruding far beyond the sides of the sporophyll.

Type in the U. S. National Herbarium, No. 1,637,830, collected at summit of range above El Achote, above the plains of Siguatepeque, Department of Comayagua, Honduras, at 1,800 meters altitude, from the stem of a tree fern in rain forest, July 28, 1936, by T. G. Yuncker, R. F. Dawson, and H. R. Youse (No. 6149). No other material has been seen.

The present species is most nearly related to *L. stamineum* Maxon (Smiths. Misc. Coll. 56, No. 29:2. *pl. 2.* 1912) of Panama and Costa Rica, which it resembles habitally. But in *L. stamineum* the leaves are more numerous, invariably bright red at base, and of great delicacy, being truly capillary. In the present plant there is no trace of red.

Lycopodium cernuum L. In a subalpine bog near El Achote.

Lycopodium reflexum Lam. On a wet cliff, river bank.

Lycopodium Tuerckheimii Maxon. On a tree fern, in forest at the summit of the range above El Achote.

SELAGINELLACEAE

SELAGINELLA Beauv.

Selaginella cuspidata Link. On a dripping cliff, river bank in pine forest above Siguatepeque.

Selaginella cuspidata var. **elongata** Spring. Wet, shady river bank.

Selaginella guatemalensis Baker. In wet ravines at El Achote; also at the summit of the range in cloud zone.

Selaginella huehuetenangensis Hieron. On a cliff along river.

PINACEAE

PINUS L.

Pinus oocarpa Schiede. A tree 18 meters tall and 45 cm. in diameter or sometimes larger. Forming a belt of pine forest about the base of the mountains which rise from the edge of the plains of Siguatepeque.

Pinus pseudostrobus Lindl. A tree 12–15 meters tall and 60–75 cm. in diameter. In open pine forest above El Achote.

ALISMACEAE

ECHINODORUS L. Rich.

Echinodorus tenellus (HBK.) Buch. In a subalpine bog near El Achote.

GRAMINEAE

ANDROPOGON L.

Andropogon bicornis L. In shallow water, margin of a marsh.

Andropogon furcatus Muhl. In old, wet pasture.

Andropogon leucostachyus HBK. In wet pasture.

ARUNDINARIA Michx.

Arundinaria sp. Two species were collected, both of which were sterile. One had stems about 6 meters tall and 2.5 cm. in diameter. The other had stems 3.5 meters tall, light green mottled with darker green spots. In wet ravines at El Achote and El Rincón.

AXONOPUS Beauv.

Axonopus rhizomatosus Swallen. In old, wet pasture.

BAMBUSA Schreb.

Bambusa sp. Stems about 6 meters tall and 5 cm. in diameter, yellow. Large clump on river bank.

ELEUSINE Gaertn.

Eleusine indica (L.) Gaertn. River bank.

ERAGROSTIS Host

Eragrostis hirta Fourn. River bank, vicinity of Siguatepeque. "Very rare. New for Honduras" (Chase).

Eragrostis tephrosanthos Schult. On a wet bank.

ERIOCHRYSIS Beauv.

Eriochrysis cayennensis Beauv. In a subalpine bog near El Achote.

LASIACIS (Griseb.) Hitchc.

Lasiacis divaricata (L.) Hitchc. Scrambling over shrubs in a thicket, edge of forest near the summit of the range above El Achote.

Lasiacis procerrima (Hack.) Hitchc. Side of a wet ravine near El Achote.

LEERSIA Sw.

Leersia hexandra Sw. In a marshy pasture.

PANICUM L.

Panicum arenicoloides Ashe. On a rocky hillside.

Panicum laxum Sw. In old, marshy pasture.

Panicum maximum Jacq. Stems up to 1.2 meters tall. River bank.

Panicum sphaerocarpon Ell. On a rocky hillside.

PASPALUM L.

Paspalum notatum Flügge. In old pasture.

Paspalum plenum Chase. River bank.

Paspalum virgatum L. In a marsh near Tela.

PENNISETUM L. Rich.

Pennisetum setosum (Sw.) Rich. In wet ditch about 30 km. west of Tela.

PENTARRHAPHIS HBK.

Pentarrhaphis scabra HBK. Inflorescence and upper parts of the stems red. In old, wet pasture.

PHARUS L.

Pharus latifolius L. In the forest above Lancetilla.

ROTTBOELLIA L. f.

Rottboellia aurita Steud. var. **stigmosa** Hack. In a marsh.

SETARIA Beauv.

Setaria geniculata (Lam.) Beauv. In marshy pasture.

SORGHASTRUM Nash

Sorghastrum nutans (L.) Nash. Inflorescence reddish brown, attractive. In an old banana plantation.

SPOROBOLUS R. Br.

Sporobolus indicus (L.) R. Br. In old, wet pasture.

TRICHOLAENA Schrad.

Tricholaena rosea Nees. River bank.

TRIPSACUM L.

Tripsacum dactyloides L. In rich soil, river bank, 6 km. west of Siguatepeque.

UNIOLA L.

Uniola Pittieri Hack. In sand near the beach west of Tela.

CYPERACEAE

CAREX L.

Carex Humboldtiana Steud. Side of a wet ravine near El Achote. The species is new for the flora of Honduras.

Carex polystachya Sw. River bank.

CYPERUS L.

Cyperus cayennensis (Lam.) Britton. In a low, wet area on plains. The species is not reported from Honduras, although naturally to be expected there.

Cyperus haspan L. In old, wet pasture.

Cyperus incompletus (Jacq.) Link. River bank. Not recorded previously from Honduras.

Cyperus prolixus HBK. In a wet ravine near El Achote. A new species record for Honduras.

Cyperus surinamensis Rottb. In old, wet pasture.

Cyperus tenerrimus Presl. In pine-forest belt in wet soil.

Cyperus unioloides R. Br. In old, wet pasture. A species new for the Honduran flora.

ELEOCHARIS R. Br.

Eleocharis flaccida (Reichenb.) Urban. In a marsh.

Eleocharis geniculata (L.) R. & S. In a subalpine bog near El Achote.

Eleocharis mutata (L.) R. & S. In a marsh. New for the Honduran flora.

Eleocharis nodulosa (Roth) Schult. In a wet field.

Eleocharis sulcata (Roth) Nees. In a subalpine bog near El Achote.

FIMBRISTYLIS Vahl

Fimbristylis diphylla (Retz.) Vahl. In an old, wet field.

FUIRENA Rottb.

Fuirena simplex Vahl. In a subalpine bog near El Achote.

LIPOCARPHA R. Br.

Lipocarpha maculata (Michx.) Torr. In a subalpine bog near El Achote.

RYNCHOSPORA Vahl

Rynchospora barbata (L.) Kunth. Plants solitary or in small clumps, scattered on a rocky hillside.

Rynchospora cephalotes (L.) Vahl. Margin of a marsh, 12 km. east of Progreso.

Rynchospora corymbosa (L.) Britton. In old, wet pasture. The species is new for the flora of Honduras.

Rynchospora cyperoides (Sw.) Mart. In a marshy field. Not reported previously from Honduras.

Rynchospora dives Standl., sp. nov.—Perennis ca. 1 m. alta fere omnino glabra, rhizomate ut videtur brevi, culmis laevibus acute triquetris sat dense foliatis; folia longa ad 9 mm. lata, marginibus scabris; paniculae laxae elongatae, corymbis paucis axillaribus compositis usque 6 cm. latis laxe multifloris, spiculis oblongo-lanceolatis brunneo-stramineis ca. 5 mm. longis sessilibus vel breviter pedicellatis, ramis hispidulis, bracteis linearibus vel fere filiformibus, infimis longissimis, glumis oblongo-lanceolatis attenuatis glabris; setae 6 nucem subaequantes retrorse scabrae pallidae; nux ca. 1 mm. longa rotundato-ovalis pallide brunnescens lucida obscure longitrorsum costata minute reticulata, rostro cum tertia parte nucis aequilongo viridi conico.—Honduras: Side of ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 15, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5900* (type in Herb. Field Mus.).

The relationship of the plant is with *R. locuples* Clarke, a species of Costa Rica, which has wider leaves and larger achenes with a relatively much longer beak.

Rynchospora polyphylla Vahl. Moist river bank about 5 km. northwest of Siguatepeque.

Rynchospora robusta (Kunth) Boeckl. In a subalpine bog near El Achote. An addition to the known flora of Honduras.

SCLERIA Berg

Scleria pterota Presl, var. **melaleuca** (Schlecht. & Cham.) Standl. On a ledge, river bank, about 5 km. northwest of Siguatepeque.

Scleria secans (L.) Urban. Scrambling over bushes in a thicket near Lake Yojoa. A common species of Central America, but not recorded heretofore from Honduras.

STENOPHYLLUS Raf.

Stenophyllus hirtellus (Schrad.) Standl. In an old, wet field. In Central America listed previously only for Guatemala.

PALMAE

CHAMAEDOREA Willd.

Chamaedorea geonomaeformis Wendl. Stems 1–1.5 meters tall and 2.5 cm. in diameter. Fruit becoming purplish black; rachis orange-red. In a wet ravine near El Achote.

Chamaedorea graminifolia Wendl. Stems up to 6 meters tall and 10–12 cm. in diameter. In forest near the summit of the range above El Achote.

Chamaedorea Lindeniana Wendl. Stems about 2 meters tall and 1–2 cm. in diameter. In a wet ravine near El Rincón.

ARACEAE

ANTHURIUM Schott

Anthurium basiattenuatum Standl., sp. nov.—Pl. IV. Epiphytica, caudiculo ut videtur brevi, internodiis brevissimis; petiolus 9–12 cm. longus gracilis supra canaliculatus, dorso obscure tricostatus geniculo ca. 1 cm. longo tumido instructus; lamina anguste oblongo-lanceolata ca. 29 cm. longa atque 8 cm. lata, apicem angustum versus longe sensim attenuata, basi acuta, crasse chartacea, opaca, supra in sicco cinereo-viridis, nervis non elevatis, subtus fere concolor, basi trinervia, costa crassa elevata, nervis lateralibus utroque latere ca. 12 angulo semirecto adscendentibus teneris prominentibus fere rectis 6–7 mm. a margine in nervum collectivum undulatum conjunctis, venis prominulis laxe reticulatis; pedunculi gracillimi petiolis paullo longiores; spatha late oblonga acutiuscula 2.5 cm. longa vel ultra ca. 1 cm. lata elevato-puncticulata; spadix sessilis 2 cm. longa vel paullo ultra 3 mm. crassus cylindricus; sepala

longitudine sua latiora.—Honduras: On fallen log in deep forest near the summit of the ridge above El Achote, in cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,850 meters, August 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6268* (type in Herb. Field Mus.).

"Spadix deep maroon; spathe, peduncles, petioles, and midrib beneath pinkish."

Anthurium concinnatum Schott. On a rotten log near the shore of Lake Yojoa.

Anthurium lucens Standl., sp. nov.—Pl. V. Caudiculus ut videtur brevis crassus, internodiis brevissimis; petiolus ca. 40 cm. longus gracilis teretiusculus dorso grosse costatus; lamina chartacea sagittato-triangularis ca. 37 cm. longa atque basi 22 cm. lata, apicem acuminatum versus sensim angustata, basi late profunde (ca. 7 cm.) cordata, lobis posticis obtusis, supra in sicco sublucida, venulis prominulis, subtus fere concolor, basi 7-nervia, nervis infimis latere exteriore nervos 3 emittentibus, costa utroque latere nervos ca. 4 adscendentes remote a margine junctos emittente; pedunculus ca. 43 cm. longus gracilis teretiusculus; spatha reflexa lineari-lanceolato-oblonga 9.5 cm. longa 12 mm. lata apice angustissime filiformi-attenuata; spadix gracilis sessilis 12 cm. longus basi 4 mm. crassus. —Honduras: In wet ravine on bank of stream near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 13, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5844* (type in Herb. Field Mus.).

"Petioles and peduncles up to 1 meter long; spathe pale maroon; spadix deep red to maroon."

Anthurium pallens Schott. Spathe and spadix green. On a rotten log in a wet ravine near El Rincón; also in deep forest near the summit of the range above El Achote.

Anthurium parvispathum Hemsl.? Spadix maroon to brown; spathe green to light red; berries greenish red. On a log in forest near the summit of the range above El Achote.

Anthurium scandens (Aubl.) Engler. Spathe and spadix green; berries white. Bottom of a ravine near El Achote; also on a tree near the shore of Lake Yojoa.

Anthurium Yunckeri Standl., sp. nov.—Pl. VI. Caudiculus crassus ut videtur brevis, internodiis brevissimis, cataphyllis latis ca. 4 cm. longis mox decompositis fibrosis; petiolus gracilis ca. 26

cm. longus subteres, geniculo vix incrassato ca. 1.5 cm. longo; lamina triangulari-oblongo-cordata 23–25 cm. longa prope basin 9 cm. lata, e basi apicem versus sensim angustata, apice longe angustissime acuminata, basi anguste profunde (ad 5 cm.) cordata, lobis posticis apice rotundatis, supra in sicco opaca griseo-viridis, costa elevata, venis prominentibus, subtus brunnescens, basi 7-nervia, costa gracili elevata utroque latere nervos ca. 7 angulo angusto adscendentes fere rectos remote a margine in nervum collectivum fere regularem conjunctos emittente, nervo tenuiore inter pares primariorum parallelo interposito, venulis prominentibus reticulatis; pedunculus gracilis petiolum aequans teretiusculus; spatha oblongo-lanceolata 5.5 cm. longa 1 cm. lata apicem versus longissime anguste attenuata; spadix sessilis vix ultra 4 cm. longus 3 mm. crassus apicem versus paullo angustatus.—Honduras: Bottom of ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 17, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5935* (type in Herb. Field Mus.).

"Spadix dark red; spathe and peduncle light red."

MONSTERA Adans.

Monstera pertusa (L.) de Vriese. On trees in a wet ravine near El Achote.

SPATHIPHYLLUM Schott

Spathiphyllum Friedrichsthalii Schott. Spathe green; spadix whitish. Stream bank in a ravine near Achote.

BROMELIACEAE

CATOPSIS Griseb.

Catopsis brevifolia Mez & Wercklé. On a tree near the shore of Lake Yojoa.

Catopsis nitida (Hook.) Griseb. On a tree in a wet ravine at El Achote.

Catopsis nutans (Sw.) Griseb. On a tree near bank of river.

Catopsis Oerstediana Mez. On a tree in forest at the summit of the range above El Achote.

Catopsis subulata L. B. Smith. On a tree, thicket on plain.

PITCAIRNIA L'Hér.

Pitcairnia sp. On ground near El Achote.

THECOPHYLLUM André

Thecophyllum montanum L. B. Smith, sp. nov.—Pl. VII. Acaule, 4 dm. altum; foliis dense crateriformi-rosulatis, 25 cm. longis, obscure punctulato-lepidotis, dorso lineis latis undulatis purpureis transverse pictis; vaginis ellipticis, 1 dm. longis; laminis ligulatis, acutis, 30–35 mm. latis, planis; scapo erecto, medio 5 mm. diametro, glabro; scapi vaginis erectis, quam internodia paulo longioribus, late ellipticis, breve triangulari-laminatis; inflorescentia pauciflora, subdensa, 5 cm. longa; bracteis primariis ex elliptico acuminatis, flores subaequantibus, nullo modo imbricatis, flores infimos 3 alteros 2 collaterales in axillis gerentibus; bracteis florigeris suborbicularibus, obtusis, 6–9 mm. longis, quam sepala bene brevioribus, late convexis, nullo modo carinatis, coriaceis, laevibus, obscure punctulatis; floribus subsessilibus; sepalis late ellipticis, obtusis, 12–15 mm. longis, coriaceis, extus glabris laevibusque; cet. ignotis.

HONDURAS: Comayagua: Epiphytic in virgin forest, summit of range above El Achote, above the plains of Siguatepeque, alt. 1,850 meters, 1936 *Yuncker, Dawson & Youse 6243* (Herb. Gray, type).

Thecophyllum montanum is most nearly related to *T. Wercklea-num* of Costa Rica. Unlike the latter it has the leaf sheaths of the same color as the blades, the primary bracts small and remote, and the floral bracts little if any broader than long.

TILLANDSIA L.

Tillandsia Butzii Mez. Leaves mottled red and green. On a tree in a ravine near El Achote.

Tillandsia cyanea E. Morr. On a tree in forest near the summit of the range above El Achote.

Tillandsia excelsa Griseb. Leaves thin, green with purple spots above, purple beneath; inflorescence branching, reddish. On a tree in forest near El Rincón.

Tillandsia fasciculata Sw. Leaves greenish purple. Bracts and peduncle red. In forest near El Achote.

Tillandsia festucoides Brongn. On a tree near shore of Lake Yojoa.

Tillandsia glossophylla L. B. Smith, sp. nov.—Pl. VIII. Acaulis, 4 dm. alta; foliis dense cyathiformi-rosulatis, 2 dm. longis,

minutissime obscureque brunneo-lepidotis; vaginis ellipticis, amplis, 1 dm. longis; laminis ligulatis, acutis, 25 mm. latis, planis, viridibus vel purpureo-afflatis; scapo erecto, 5 mm. diametro; scapi bracteis erectis, dense imbricatis, late ovatis, apiculatis vel infimis acuminatis, glabris, nervatis; inflorescentia simplicissima, lineari-lanceolata, acuta, 18 cm. longa, 25 mm. lata, complanata; bracteis florigeris erectis, dense imbricatis, late ellipticis, obtusis, 3 cm. longis, sepala subaequantibus, ecarinatis, carneo-rubris, glabris, nervatis, subcoriaceis; floribus subsessilibus; sepalis anguste ellipticis, obtusis, subchartaceis, valde nervatis, glabris, liberis; petalis linearibus, laminis anguste ellipticis, 1 cm. longis; staminibus inclusis; stylo elongato; capsulis quam sepala paulo longioribus.

HONDURAS: Comayagua: In ravine near El Achote, above the plains of Siguatepeque, alt. 1,350 meters, 1936, *Yuncker, Dawson & Youse 5934* (Herb. Gray, type).

Tillandsia glossophylla appears to be more nearly related to *T. Walteri* Mez of Peru and Bolivia than to any North American species. *T. Walteri* differs in its triangular leaf blades and generally larger flower parts.

Tillandsia grandis Schlecht. In forest near El Achote.

Tillandsia juncea (R. & P.) LeConte. Peduncles and leaf tips blood-red. On a tree near bank of river.

Tillandsia lampropoda L. B. Smith, sp. nov.—Pl. IX. Acaulis, ad 43 cm. alta; foliis multis, substrictis, anguste cyathiformi-rosulatis, inflorescentiam subaequantibus; vaginis oblongo-ellipticis, 1 dm. longis, dense obscureque punctulatis, fulgide purpureis; laminis angustissime triangularibus, caudato-acuminatis, base 15–20 mm. latis, densissime adpresseque cinereo-lepidotis; scapo erecto, 6 mm. diametro, glabro; scapi bracteis erectis, imbricatis, late ovatis, apiculatis vel infimis anguste caudato-laminatis, perobscure punctulatis, laevibus, lucidis, vivo rubris; inflorescentia simplicissima, elliptica, acuta, valde complanata, 15 cm. longa, 7 cm. lata; bracteis florigeris distichis, dense imbricatis, quam internodia 8-plo longioribus, late ovatis, acutis, 5 cm. longis, 4 cm. latis, valde carinatis, coriaceis, laevibus, lucidis, perobscure punctulatis, ad apicem versus cinereo-lepidotis, apice citrinis, base rubris, anguste atro-marginatis; floribus solum imperfecte cognitis, subsessilibus; sepalis anguste lanceolatis, acutis, 32 mm. longis, carinatis, coriaceis, nervatis, glabris, liberis; petalis ca. 5 cm. longis; stylo elongato.

HONDURAS: Comayagua: On tree near El Achote, above the plains of Siguatepeque, alt. 1,350 meters, 1936, *Yuncker, Dawson & Youse 5895* (Herb. Gray, type).

It is not possible to see whether the stamens are exserted or not, but the style is much too long for the section *Phytarrhiza.* Consequently it must belong to either *Platystachys* or *Allardtia,* and I am inclined to feel that it is probably the latter. In habit *T. lampropoda* resembles the larger varieties of *T. fasciculata,* but the purple leaf sheaths and lustrous, mostly apiculate scape bracts readily distinguish it. Also in *T. fasciculata* the scales are uniform and completely cover the sheath and blade, while in *T. lampropoda* there is an abrupt transition from the inconspicuous, separated, punctiform scales of the sheath to the much larger, overlapping ones of the blade.

Tillandsia Leiboldiana Schlecht. Leaves green above, purplish beneath; inflorescence bright red. On a tree in ravine near El Achote. An exceptionally attractive species.

Tillandsia Makoyana Baker. On a tree near Siguatepeque.

Tillandsia multicaulis Steud. Leaves green, becoming purple toward the base; bracts yellow. On a tree in forest near El Achote.

Tillandsia polystachya L. Leaves green with faintly purple tips. On a tree in thicket near bank of river.

Tillandsia pruinosa Sw. On a tree near the shore of Lake Yojoa.

Tillandsia punctulata Cham. & Schlecht. Leaves green, becoming purplish at the base; inflorescence red. On a tree in forest at the summit of the range above El Achote.

Tillandsia recurvata L. Flowers white to lavender. On a tree in a thicket on plain.

Tillandsia Schiedeana Steud. Leaves reflexed; peduncles red. On a tree in forest near El Achote.

Tillandsia Standleyi L. B. Smith. Peduncles and bracts scarlet. A very attractive species. On a tree in forest near El Achote. Known only from this region.

Tillandsia usneoides L. Common on trees on the plains and hills; also about Lake Yojoa.

Tillandsia vestita Cham. & Schlecht. On a tree near the shore of Lake Yojoa.

Tillandsia Yunckeri L. B. Smith, sp. nov.—Pl. X. Acaulis, verisimiliter 5 dm. alta; foliis multis, crateriforme rosulatis, rectis, 4 dm. longis, valde purpureo-suffultis; vaginis late ellipticis, ca. 15 cm. longis, dense punctulato-lepidotis; laminis ligulatis, acutis, ad 5 cm. latis, planis, supra glabris, subtus obscure punctulato-lepidotis; scapo erecto, valido, glabro; scapi bracteis erectis, dense imbricatis, foliaceis, magnis; inflorescentia composita, anguste pyramidata, 2 dm. longa, ad apicem versus densa; bracteis primariis suborbicularibus, breve foliaceo-laminatis, spicas axillares superantibus amplexantibusque, vivo fulgide rubris, laevibus, glabris, lucidis; spicis sessilibus, late lanceolatis, acutis, dense 4-floris, basi bractea sterili praeditis, 65 mm. longis, 25 mm. latis, complanatis, supremis suberectis, infimis patentibus; bracteis florigeris ovato-lanceolatis, acutis, ad 45 mm. longis, sepala multo superantibus, acute carinatis et lateribus planis, coriaceis, laevibus vel obscure nervatis, glabris; floribus subsessilibus; sepalis lanceolatis, acuminatis, 3 cm. longis, coriaceis, glabris, acute carinatis, posterioribus alte connatis; petalis tubuloso-erectis, 5–6 cm. longis; staminibus verisimiliter exsertis.

HONDURAS: Comayagua: Epiphytic in forest at summit of range above El Achote, above the plains of Siguatepeque, alt. 1,800 meters, 1936, *Yuncker, Dawson & Youse 6432* (Herb. Gray, type); *6031* (Herb. Gray, cotype).

The material at hand does not show with certainty whether the stamens are exserted or included, but the probability is that *Tillandsia Yunckeri* belongs to the section *Platystachys*, where it is most closely related to *T. prodigiosa* Baker. It differs from this latter species in its much fewer-flowered spikes and very short-bladed primary bracts as well as in its ligulate, acute leaves.

COMMELINACEAE

CAMPELIA L. Rich.

Campelia Zanonia (L.) HBK. An herb, about 1.5 meters tall. Flowers pinkish violet; fruit violet. In sandy soil, bottom of a wet ravine near El Achote.

COMMELINA L.

Commelina coelestis Willd. An herb about 50 cm. tall. Flowers blue. In old, wet pasture.

TINANTIA Scheidw.

Tinantia erecta Schlecht. Stems very succulent, up to 1 meter tall and 1.5 cm. in diameter. Petals deep blue. River bank about 6 km. north of Siguatepeque.

TRADESCANTIA L.

Tradescantia elongata Mey. Petals violet to pink. In a wet ravine near El Achote.

PONTEDERIACEAE

EICHHORNIA Kunth

Eichhornia azurea (Sw.) Kunth. In a stream between Tela and Lancetilla Valley.

HETERANTHERA R. & P.

Heteranthera limosa (Sw.) Willd. Flowers pale lavender, delicate. In wet ditches.

Heteranthera reniformis R. & P. Corolla white. In a subalpine bog near El Achote.

LILIACEAE

SCHOENOCAULON Gray

Schoenocaulon officinale (Schl. & Cham.) Gray. An herb with white flowers. In moist soil, river bank.

SMILACINA Desf.

Smilacina paniculata Mart. & Gal. Flowers white; branches of the inflorescence and the berries reddish. In forest near the summit of the range above El Achote.

SMILACACEAE

SMILAX L.

Smilax subpubescens A. DC. A woody vine. In a thicket at the margin of forest near the summit of the range above El Achote.

Six additional species of *Smilax* were collected in sterile condition, of which four are believed by C. V. Morton to be new species though not describable in their sterile condition.

AMARYLLIDACEAE

BOMAREA Mirb.

Bomarea ovata (Cav.) Mirb. Sepals yellow flushed with pink; corolla greenish with maroon spots. Climbing in a thicket near river bank about 6 km. north of Siguatepeque.

CRINUM L.

Crinum cruentum Ker. In a low, marshy area between Tela and Lancetilla Valley.

IRIDACEAE

SISYRINCHIUM L.

Sisyrinchium alatum Hook. Flowers bright yellow. In wet soil.

MUSACEAE

HELICONIA L.

Heliconia librata Griggs. Plant about 3 meters tall; bracts golden yellow. In rich, moist forest near Lake Yojoa.

Heliconia pendula Wawra. An herb about 2 meters tall; peduncle and bracts bright red. Bottom of a wet ravine near El Achote; also near Tela River, Lancetilla Valley.

ZINGIBERACEAE

HEDYCHIUM Koenig

Hedychium coronarium Koenig. In moist soil between Tela and Lancetilla Valley.

RENEALMIA L. f.

Renealmia aromatica (Aubl.) Griseb. Stems about 1 meter tall; inflorescence scarlet. In a wet ravine near El Rincón.

MARANTACEAE

CALATHEA Meyer

Calathea verapax Donn. Sm. An herb about 1 meter tall; bracts scarlet. In a wet ravine near El Rincón.

ORCHIDACEAE

BRASSAVOLA R. Br.

Brassavola cucullata R. Br. On a tree in Lancetilla Valley.

CATASETUM L. Rich.

Catasetum maculatum Kunth. On a tree near the shore of Lake Yojoa.

COMPARETTIA Poepp. & Endl.

Comparettia falcata Poepp. & Endl. Flowers pink. On a tree near El Achote.

CRANICHIS Sw.

Cranichis pseudociliata Schltr. In humus in deep forest near the summit of the range above El Achote.

DICHAEA Lindl.

Dichaea muricata (Sw.) Lindl. On a tree near the shore of Lake Yojoa.

Dichaea trichocarpa Lindl. On a tree in a wet ravine near El Rincón.

EPIDENDRUM L.

Epidendrum Brassavolae Reichb. f. On a tree near the summit of the range above El Achote.

Epidendrum centropetalum Reichb. f. On a tree in cloud zone near the summit of the range above El Achote.

Epidendrum Chloe Reichb. f. On a tree near the summit of the range above El Achote.

Epidendrum cochleatum L. On a tree near the shore of Lake Yojoa.

Epidendrum cobanense Ames & Schltr. Flower parts fleshy, golden-yellow turning to brown. On a tree in wet ravine near El Achote.

Epidendrum difforme Jacq. On a tree near the shore of Lake Yojoa.

Epidendrum Lindleyanum (Batem.) Reichb. f. On a tree in a subalpine bog near El Achote.

Epidendrum luteoroseum A. Rich. & Gal. On a tree in pine-oak association near El Achote.

Epidendrum ochraceum Lindl. On a tree near the summit of the range above El Achote.

Epidendrum polyanthum Lindl. On a tree near the shore of Lake Yojoa.

Epidendrum polyanthum var. **myodes** (Reichb. f.) Ames, Hubb. & Schweinf. On a tree in a wet ravine at El Achote.

Epidendrum polybulbon Sw. On a tree in a ravine near El Achote.

Epidendrum pygmaeum Hook. On a tree in forest near the summit of the range above El Achote.

Epidendrum radicans Pav. ex Lindl. In a subalpine bog near El Achote.

Epidendrum ramosum Jacq. var. **mixtum** (Schltr.) Ames, Hubb. & Schweinf. On a pine tree in forest above El Achote.

Epidendrum rhynchophorum A. Rich. & Gal. On an oak tree in forest near El Achote.

Epidendrum teretifolium Sw. On a tree near El Achote.

Epidendrum Tuerckheimii Schltr. On an oak tree near El Achote.

Epidendrum virgatum Lindl. Rocky river bank.

ERYTHRODES Blume

Erythrodes Tuerckheimii (Schltr.) Ames. Terrestrial. In forest near the summit of the range above El Achote.

GONGORA Ruiz & Pav.

Gongora cassidea Reichb. f. On a tree in a ravine near El Achote.

GOVENIA Lindl.

Govenia Powellii Schltr. Flowers white. On river bank.

HABENARIA Willd.

Habenaria clypeata Lindl. *Lactiflora* form. On ground in pine forest near El Achote.

Habenaria crassicornis Lindl. On ground in a wet ravine near El Achote.

Habenaria novemfida Lindl. On ground in grass above El Achote.

Habenaria setifera Lindl. On ground in grass near El Achote.

IONOPSIS HBK.

Ionopsis utricularioides (Sw.) Lindl. On a tree near river.

ISOCHILUS R. Br.

Isochilus linearis R. Br. On a tree in a wet ravine near El Achote: also near the shore of Lake Yojoa.

LEPANTHES Sw.

Lepanthes acuminata Schltr. On a rotten log in forest in cloud zone near the summit of the range above El Achote. First report of this species from Honduras.

Lepanthes Dawsonii Ames, sp. nov.—Herba epiphytica, dense caespitosa. Caules secundarii gracillimi, plus minusve quinquevaginati, apice unifoliati, vaginarum ostiis obscure hispidis. Folium elliptico-lanceolatum, breviter petiolatum. Inflorescentiae folio breviores. Flores succedanei. Sepala lateralia anguste lanceolata. Sepalum dorsale simile. Petala late reniformia. Labellum trilobatum, lobis lateralibus linearibus, lobo medio minute glanduloso.

Epiphytic herb, up to 4 cm. tall. Secondary stems erect or obliquely ascending, 2–2.5 cm. long, concealed by about six closely appressed, obscurely hispidulose sheaths which terminate in infundibuliform openings. Leaf 1–1.5 cm. long, about 6 mm. wide, elliptic-lanceolate with the apex minutely tridentate. Flowers few, opening in succession in abbreviated racemes. Lateral sepals 4 mm. long, about 1 mm. wide, united to about the middle, narrowly lanceolate, acuminate, acute, conspicuously 1-nerved through the middle. Dorsal sepal similar and about equal to the laterals in length. Petals reniform, 1 mm. in the longest dimension. Labellum 3-lobed; lateral lobes hardly 1 mm. long, linear, sharply incurved at the distal end; mid-lobe much shorter than the laterals, narrowly triangular, minutely and obscurely glandulose. Column dilated upward.

Lepanthes Dawsonii is an ally of *L. acuminata* Schltr. from which it differs in having smaller flowers in which the labellum has a pronounced mid-lobe. In dried specimens the sepals are orange-yellow, with an amethyst-purple labellum.

HONDURAS: Above the plains of Siguatepeque, on tree trunk in forest near the summit of the range above El Achote, in cloud zone, at 1,800 meters altitude, July 28, 1936. *T.G. Yuncker, R.F. Dawson & H. R. Youse 6152A* (type in Herb. Ames No. 43769).

Lepanthes Yunckeri Ames, sp. nov.—Herba epiphytica, dense caespitosa. Caules secundarii gracillimi, plus minusve quinquevaginati, apice unifoliati, vaginarum ostiis hispidis. Folium ellipticum, marginatum, breviter petiolatum. Inflorescentiae singulae vel duae, folio breviores. Flores succedanei. Sepala lateralia ovato-lanceolata, acuminata, valde acuta. Petala rhomboidea. Labellum integrum, cordato-suborbiculare, leviter retusum. Columna generis.

Epiphytic herb, up to 4.5 cm. tall. Secondary stems 0.5–2 cm. long, concealed by about five closely appressed, hispid sheaths which terminate in infundibuliform openings. Leaf about 1 cm. long, up to 6 mm. wide, elliptic, marginate, coriaceous, with the apex minutely tridenticulate. Peduncles about 7 mm. long, shorter than the leaves, arising in the axil of a leaf, emerging singly or in pairs and bearing a several-flowered, abbreviated inflorescence, the flowers opening in succession. Sepals 4 mm. long, about 2.5 mm. wide with the dorsal sepal 3-nerved and the laterals 2-nerved. Petals rhomboidal, laterally prolonged into subcaudate tips, 3 mm. in the longest dimension. Labellum cordate-suborbicular, retuse in front, 2 mm. long, 2 mm. wide, 3-nerved. Column dilated upward.

Lepanthes Yunckeri resembles *L. eximia* Ames in the vegetative structures and in having the labellum simple rather than bilobed, but differs markedly in the outline of the petals and in the more abbreviated peduncles. From dried specimens the sepals appear to have been yellowish and the lip purplish with a tawny margin.

HONDURAS: Above Siguatepeque, on tree trunk in forest near the summit of the range above El Achote, in cloud zone, at 1,800 meters altitude, July 28, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6152* (type in Herb. Ames No. 46887).

LEPANTHOPSIS Ames

Lepanthopsis floripecten (Reichb. f.) Ames. Flowers light brown. On a tree in wet ravine near El Achote.

MALAXIS Sw.

Malaxis aurea Ames. Flowers greenish. On ground, stream bank.

Malaxis Maxonii Ames. Flowers greenish. On a rotten log in forest near the summit of the range above El Achote.

Malaxis Parthonii Morr. On ground in a wet ravine near El Achote.

MAXILLARIA R. & P.

Maxillaria uncata Batem. On a tree above Lancetilla Valley.

Maxillaria variabilis Batem. On a tree near the shore of Lake Yojoa.

NOTYLIA Lindl.

Notylia trisepala Lindl. & Paxt. On a tree, hills above Lancetilla Valley.

ONCIDIUM Sw.

Oncidium carthaginense Sw. On a tree, plains near Siguatepeque.

Oncidium graminifolium Lindl. On rocks in a ravine near El Achote.

Oncidium leucochilum Batem. On a tree, rocky river bank.

PELEXIA Poit.

Pelexia hondurensis Ames. On ground in a wet ravine near El Achote.

PLEUROTHALLIS R. Br.

Pleurothallis Carioi Schltr. On a tree, bank of river.

Pleurothallis fuegii Reichb. f. On a tree near the summit of the range above El Achote. Very rare.

Pleurothallis hirsuta Ames. On a fallen tree trunk near El Achote.

Pleurothallis Johnsonii Ames. On a rocky cliff near El Achote.

Pleurothallis pansamalae Schltr. On a tree, summit forest above El Achote.

POLYSTACHYA Hook.

Polystachya luteola Hook. On a rotten log, hills above Lancetilla Valley.

Polystachya minor Fawc. & Rendl. Flowers fleshy, rich yellow. On trees in a wet ravine near El Achote.

RESTREPIA HBK.

Restrepia xanthophthalma Reichb. f. On tree near El Achote.

SARCOGLOTTIS Presl

Sarcoglottis picta Klotzsch. Flowers greenish white. In wet soil under trees.

SCHOMBURGKIA Lindl.

Schomburgkia tibicinis Batem. On coconut palms near San Juan Carib village, west of Tela.

SOBRALIA Ruiz & Pav.

Sobralia macrantha Lindl. On ground in a wet ravine near El Achote.

STANHOPEA Hook.

Stanhopea ecornuta Lem. Flowers large, white. On a tree near the shore of Lake Yojoa.

STELIS Sw.

Stelis hymenantha Schltr. On a tree near the summit of the range above El Achote.

Stelis thecoglossa Reichb. f. On a tree near the summit of the range above El Achote.

VANILLA Sw.

Vanilla pompona Schiede. Fruit triangular in section, up to 15 cm. in length. Climbing in a thicket, river bank.

PIPERACEAE

PEPEROMIA Ruiz & Pavón

Peperomia aggravescens Trelease, sp. nov.—Herba late prostrata et radicans stolonifera, caulibus modice brevibus adsurgentibus rubris foliatis sparse minute hispidulis ad glabrescentibus vix 2 mm. crassis; folia alterna, caulium sterilium orbicularia et 1 cm. lata, alia subrhombeo-elliptica et plus minusve obtuso-acuminata vel lanceolata atque acuta, basi acuta, 2–2.5 cm. longa, 1–1.5 cm. lata, 1- vel obscure 3–5-nervia, subtus pallidiora, in sicco subcoriacea opaca; petiolus 3–5 mm. longus amplexicauli-decurrens; spicae terminales 50–60 mm. longae 1 mm. crassae, pedunculo gracili 10 mm. longo; bracteae rotundo-peltatae, ovario suboblique apiculato, stigmate subapicali.

HONDURAS: On rotting wood, cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 5990* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.), also *No. 6188* from the same locality.

Peperomia amnicola Trelease, sp. nov.—Herba majuscula repenti-adsurgens epiphytica glabra, caule 3 mm. crasso; folia alterna elliptico-oblanceolata vel subobovata subobtuso-acuminata, basi cuneata, 4–7 cm. longa 2–3 cm. lata, 5–7-nervia, nervis basin versus confluentibus, in sicco firma, subtus pallidiora, petiolo circiter 5 mm. longo; spicae apicales, immaturae tantum visae.

HONDURAS: On a tree, river bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5799* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia argumentosa Trelease, sp. nov.—Herba parvula rhizomatosa glabra, caule vix 2 mm. crasso; folia alterna elliptica vel elliptico-subobovata abrupte breviter acuminata 3–5 cm. longa 2–3 cm. lata 3–5-nervia, in sicco coriacea, subtus flavescentia, petiolo gracili ca. 10 mm. longo; spicae terminales et ex axillis superioribus nascentes vix 60–70 mm. longae et 2 mm. crassae, pedunculo 10–15 mm. longo; bracteae rotundo-peltatae; baccae rotundato-ovoideae subapiculatae, stigmate obliquo.

HONDURAS: On a log in ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5966* (type in herb. Univ. Illinois).

Peperomia caducipilosa Trelease, sp. nov.—Frutex radicanti-pendula arboricola evanescente subconspicue molliter pilosa, caule 2–3 mm. crasso; folia lanceolato-elliptica vel ovato-elliptica acute acuminata, basi subacuta vel latiora basi obtusa, versus basin pinnatinervia, 4–11 cm. longa 2–4.5 cm. lata, petiolo 1.5–2.5 cm. longo subpersistente pubescente; spicae terminales breves solitariae, pedunculo aequilongo medio bracteato, bracteis rotundo-peltatis.

HONDURAS: Lancetilla Valley, alt. 30 meters, *Yuncker 4544* (type in herb. Univ. Illinois).

Peperomia chucanebana Trelease. On tree near Lake Yojoa, at 630 meters.

Peperomia circulifolia Trelease, sp. nov.—Herba parvula plus minusve repens caespitosa arboricola, caule 1–2 mm. crasso primo velutino; folia saepe 5–6-verticillata elliptico-obovata emarginulata, basi acuta, ca. 10 mm. longa atque 5 mm. lata, vix plus quam 1-nervia, margine ciliata, ciliis rectis, subtus tantum transiente flavescentia, subtus hispidula, supra minus dense hispidula, petiolo ca. 2 mm. longo hispidulo; spicae terminales 20 mm. longae 1 mm. crassae, pedunculo gracili 10 mm. longo sparse minute hispidulo; bracteae rotundo-peltatae.

HONDURAS: In a wet ravine on a tree trunk near El Achote, above Siguatepeque, Department of Comayagua, at 1,350 meters, *Yuncker, Dawson & Youse 6361* (type in herb. Univ. Illinois).

Peperomia circulifolia var. **flava** Trelease, var. nov.—Folia magis obovata ca. 10 mm. longa et 8 mm. lata subtus subpersistente opaco-flavescentia; planta terrestris.

HONDURAS: In the same region as the typical form of the species, at 1,350 meters, *Yuncker, Dawson & Youse 5869* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia circulifolia var. **eciliata** Trelease, var. nov.—Var. *flavae* valde similis, foliis 3-nerviis tenuioribus minus flavescentibus non radiato-ciliatis.

HONDURAS: Region of the typical form of the species at 1,350 meters, *Yuncker, Dawson & Youse 6360* (type in herb. Univ. Illinois).

Peperomia collocata Trelease, sp. nov.—Herba parvula rhizomatoso-adsurgens glabra, caule 1 mm. crasso; folia alterna elliptico-subspathulata plerumque obtusa, basi subcuneata, 3.5–7 cm. longa 1.5–3 cm. lata, ca. 5-nervia, nervis 10–15 mm. longe confluentibus, in sicco subfirma, subtus pallidiora, petiolo gracili 5 mm. longo; spicae terminales et ex axillis superioribus nascentes 70 mm. longae 1 mm. crassae, pedunculo gracili fere 25 mm. longo; bracteae rotundo-peltatae; ovarium oblique apicatum, stigmate subapicali.

HONDURAS: On a log in a ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6106* (type in herb. Univ. Illinois).

Peperomia condormiens Trelease, sp. nov.—Herba modice alta sed delicata subsimplex glabra, caule gracillimo; folia alterna orbiculari-ovata emarginata basi rotundata vel ad petiolum abrupte angustata, 1.5–2.5 cm. longa et aequilata, 5–7-nervia, nervis superioribus in foliis longioribus e basi distincte separatis, supra intense viridia, subtus pallidiora, petiolo gracili vix 10 mm. longo; spicae terminales 70 mm. longae 1 mm. crassae, pedunculo 25 mm. longo; bracteae rotundo-peltatae; ovarium ovoideum, stigmate apicali stylum brevem terminante.

HONDURAS: Summit in forest above El Achote, above Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6237* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia conocarpa Trelease, sp. nov.—Herba modice parva glabra rhizomatosa, ramis fertilibus erectis simplicibus, caule vix 2 mm. crasso sulcato; folia 3–4-verticillata elliptico-obovata emarginata, basi cuneata, 6–12 mm. longa 4–8 mm. lata, in sicco viridia subtenuia sed opaca, vix plus quam 1-nervia, petiolo 1–2 mm. longo; spicae terminales subfiliformes 15–25 mm. longae, pedunculo filiformi aequilongo; bracteae rotundo-peltatae; baccae late conicae pseudocupula basali stipatae, stigmate apicali stylum brevem terminante.

HONDURAS: On a tree trunk in forest, cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6189* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.); also *No. 6010.*

Peperomia Dawsoni Trelease, sp. nov.—Herba subparva longirepens lignicola, caule 2 mm. crasso plus minusve minute hispidulo; folia alterna orbicularia vel rotundo-ovata, rare sublanceolata, apice rotundata vel obtuse breviter acuminata aliquanto emarginulata, 1–1.5 cm. longa et aequilata, obscure trinervia, coriacea, subtus flavescentia, petiolo filiformi 2–7 mm. longo sparse minute hispidulo; spicae terminales 25 mm. longae 1 mm. crassae, pedunculo vix 5 mm. longo, bracteis rotundo-peltatis; ovarii apex obliquus, stigmate subapicali.

HONDURAS: On a rotten log in forest, cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6009* (type in herb. Univ. Illinois).

Peperomia defluens Trelease, sp. nov.—Herba majuscula radicanti-pendula glabra, caule 2 mm. crasso; folia subelliptica vel ovata acuminata, basi obtusa, 11 cm. longa 3–5 cm. lata, basin versus pinnatinervia, petiolo 1 vel in foliis inferioribus 4 cm. longo; spicae terminales statu fructifero 80–100 mm. longae 4 mm. crassae, pedunculo 20–30 mm. longo prope medium bracteato; baccae anguste oblongae oblique acuto-scutulatae, stigmate in scutulo centrali.

HONDURAS: In forest, Lancetilla Valley, 27 meters, *Yuncker 4916* (type in herb. Univ. Illinois); also at 30 meters, *Yuncker 4630.*

Peperomia eripipunctulata Trelease, sp. nov.—Herba subparva stolonifero-adsurgens glabra non nigro-punctulata, faciem *P. rubefactae* simulans, caule 2 mm. crasso; folia alterna lanceolata vel elliptica subobtuso-acutata, basi acuta, 2.5–5 cm. longa 1–2 cm. lata, 3-nervia vel minus conspicue 5-nervia, nervis interioribus inferne confluentibus, in sicco subcoriacea, subtus pallidiora, petiolo vix 10 mm. longo; spicae terminales vix 40 mm. longae et 2 mm. crassae, pedunculo 5 mm. longo.

HONDURAS: On a rotten log in ravine near El Rincón, about 10 miles west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6079* (type in herb. Univ. Illinois); in a ravine near El Achote, above Siguatepeque, 1,350 meters, *No. 6104.*

Peperomia filici-decorans Trelease, sp. nov.—Herba subparva repenti-adsurgens arboricola, caule 2 mm. crasso transiente minute crispo-puberulo; folia ternata vel quaternata lanceolata obtuse protracto-acuminata, basi acuta, vix 2.5–3 cm. longa atque 1–2 cm. lata, 3-nervia, sparse crispo-puberula vel glabrescentia, firma, subtus pallidiora, petiolo 3–4 mm. longo; spicae terminales 20 mm. longae 1 mm. crassae, pseudo-pedicellis sparsis, pedunculo gracili 15–20 mm. longo, bracteis rotundo-peltatis.

HONDURAS: On the trunk of tree fern, ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6105* (type in herb. Univ. Illinois).

Peperomia flagitans Trelease, sp. nov.—Herba subparva simplex sed plus minusve caespitosa glabra, caulibus vix 2 mm. crassis; folia alterna elliptico-subobovata apice obtusa et emarginulata, basi cuneata, 2.5–3.5 cm. longa 1.5 2 cm. lata, 5-nervia, in sicco coracea atque opaca, petiolo 5 mm. longo amplexicauli decurrente; spicae terminales 60 mm. longae 2 mm. crassae, pedunculo 10–20 mm. longo.

HONDURAS: River bank 6 km. west of Siguatepeque, Department of Comayagua, 1,200 meters, *Yuncker, Dawson & Youse 6383* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia inaudax Trelease, sp. nov.—Herba modice parva simplex erecta glabra, caule vix 2 mm. crasso; folia alterna elliptica vel inferiora subobovata emarginulata, basi acuta, 2.5–3.5 cm. longa 1.5–2 cm. lata 1-nervia vel obscure 3-nervia, subtus pallidiora, petiolo 5 mm. longo amplexicauli-decurrente; spicae terminales 50 mm. longae 2 mm. crassae, pedunculo 20 mm. longo, bracteis rotundo-peltatae; baccae 1.5 mm. longae ovoideo-cylindraceae, pedicellis in maturitate gracilibus aequilongis, stigmate in apice scutelli oblique concavi inserto.

HONDURAS: On a log in forest, cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,850 meters, *Yuncker, Dawson & Youse 6242* (type in herb. Univ. Illinois).

Peperomia lancetillana Trelease, sp. nov.—Herba modice alta diffusa et radicans glabra, caule ca. 3 mm. crasso; folia alterna obovata et obtusa vel subrhombica et subulato-apicata, basi cuneata, 5–9 cm. longa 2.5–3.5 cm. lata pinnatinervia, in sicco coriacea, petiolo 1–2 vel 3.5 cm. longo; spicae terminales et sympodiales 70–120 mm. longae 1–2 mm. crassae, pedicellis 2–3 cm. longis in apice pedunculi 1-bracteati duplo longioris geminatis, bracteis minutis rotundo-peltatis; baccae ellipsoideae rostratae, stigmate ad basin rostri anteriore.

HONDURAS: Lancetilla Valley, near Tela, 60 meters, *Yuncker 4943* (type in herb. Univ. Illinois); at 30 meters, *Yuncker 4629;* at 75 meters, *Yuncker 5084.*

Peperomia lancetillana var. **spathifolia** Trelease, var. nov. —Caulis brevissimus, internodiis brevibus; folia elliptico-spathulata vel obovato-spathulata obtusa basi longe cuneata 7–10 cm. longa 2.5–4.5 cm. lata; spica solitaria 50–75 mm. longa 2 mm. crassa, pedunculo longiore.

HONDURAS: Lancetilla Valley, 60 meters, *Yuncker 5040* (type in herb. Univ. Illinois).

Peperomia laudabilis Trelease, sp. nov.—Herba subparva simplex stolonifera, foliis decidue puberulo-ciliatis exceptis glabra, caule 1 mm. crasso; folia alterna elliptico-oblanceolata vel subobovata apice rotundata vel subtruncata, basi subcuneata, 1.5–4.5 cm. longa 1–1.5 cm. lata, 2–4-nervia, in sicco viridia tenuia, petiolo 5 mm. longo; spicae terminales et axillares 50 mm. longae 1 mm. crassae, pedunculo filiformi 20 mm. longo et ultra, bracteis rotundo-peltatis; baccae ovoideae apice obliquae, stigmate subapicali.

HONDURAS: On a tree base, El Achote, near Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6298* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia longiacuminata Trelease. On a log in forest, Lancetilla Valley, at 30 meters.

Peperomia mala Trelease. sp. nov.—Herba subparva rhizomatosa adsurgens glabra, caule 2–3 mm. crasso 4-lineato; folia alterna elliptica subacuta, basi acuta, 20–55 mm. longa 10–23 mm. lata obscurissime 3–5-nervia, coriacea, subtus pallidiora, petiolo 5–10 mm. longo amplexicauli-decurrente; inflorescentia?

HONDURAS: On a tree trunk, river bank, Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5737* (type in herb. Univ. Illinois).

Peperomia mollipubis Trelease, sp. nov.—Herba modice alta adsurgens ubique gracili-pilosa, caule 1–3 mm. crasso; folia alterna subrhombice elliptica vel obovata obtusa interdum obscure emarginulata, basi acuta, 3.5–4 cm. longa 1.5–2.5 cm. lata 5-nervia, subtus pallidiora, in sicco tenuia sed opaca, petiolo gracili 20–30 mm. longo; spicae terminales et ex axillis superioribus nascentes in statu juvenili 25 mm. longae 2 mm. crassae, pedunculo brevi crasso, bracteis rotundo-peltatis margine hispidis.

HONDURAS: In a ravine at El Achote, near Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6367* (type in herb. Univ. Illinois).

Peperomia montis-verticis Trelease, sp. nov.—Herba modice alta adsurgens glabra, caule 2 mm. versus basin crasso; folia alterna subelliptica obtuse breviter acuminata basi acuta, 4–7 cm. longa 2–3 cm. lata 5-nervia, in sicco subcoriacea, petiolo gracili circiter 10 mm. longo amplexicauli-decurrente; spicae 60 mm. longae 2 mm. crasse apiculatae, pedunculo 5 mm. longo, bracteis rotundo-peltatis.

HONDURAS: Cloud zone near summit of the range above El Achote, near Siguatepeque, Department of Comayagua, 1,850 meter, *Yuncker, Dawson & Youse 6244* (type in herb. Univ. Illinois).

Peperomia nebuligaudens Trelease, sp. nov.—Herba parva stolonifero-adsurgens glabra, caule 2–3 mm. crasso, internodiis brevibus; folia alterna elliptica vel subobovata, majora subacuta, basi acuta, 2–6 cm. longa 1–3 cm. lata 3-nervia, subtus pallidiora, in sicco coriacea et opaca, petiolo 5–10 mm. longo amplexicauli-decurrente; spicae terminales in statu juvenili 30 mm. longae 2–3 mm. crassae, pedunculo 10 mm. longo, bracteis rotundo-peltatis; baccae sunglobosae, stigmate in apice obliquo subapicali.

HONDURAS: Cloud region above El Achote, near Siguatepeque, Department of Comayagua, 1,850 meters, *Yuncker, Dawson & Youse 6186* (type in herb. Univ. Illinois).

Peperomia novae-hispaniae Trelease. Near Paral, shore of Lake Yojoa, Department of Cortés, at 630 meters.

Peperomia novella Trelease, sp. nov.—Herba modice alta lignicola adsurgens, superne foliata et ramosa, caule 3 mm. basin versus crasso subpersistente puberulo; folia vulgo ternata vel quaternata subspathulata obtusa vel subtruncata, basi cuneata, 10–25 mm. longa 4–10 mm. lata, in sicco firma, subtus flavescentia, vix plus quam 1-nervia, supra ad costam puberula, subtus sparse puberula, petiolo 2–3 mm. longo puberulo; spicae immaturae, terminales, bracteis rotundo-peltatis.

HONDURAS: On a rotten log in forest, cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6139* (type in herb. Univ. Illinois).

Peperomia opaca Trelease, var. **ciliata** Trelease, var. nov.—Herba modice alta rhizomatosa caespitosa faciem *P. reflexae* simulans, caule primo rigido-pubescente, foliis plus minusve rigidociliatis; spicae in statu juvenili 20 mm. longae 2 mm. crassae, pedunculo 10–12 mm. longo rigido-pubescente, rhachide pubescente; baccae subcylindraceae, pseudocupula basali, apice acutatae, stigmate apicali.

HONDURAS: Cloud zone above El Achote, near Siguatepeque, Department of Comayagua, 1,850 meters, *Yuncker, Dawson & Youse 6187* (type in herb. Univ. Illinois); also at 1,800 meters, *No. 6008;* at 1,500 meters, *No. 6078*; and at 1,350 meters, *No. 6366.*

Peperomia perplexa Trelease. On tree near Lake Yojoa, Department of Cortés, at 630 meters.

Peperomia petenensis Trelease, var. **hondurensis** Trelease, var. nov.—Folia 7 cm. longa, 4 cm. lata et acuta, vel 12 cm. longa, 7 cm. lata et profunde emarginata; spicae juveniles 90 mm. longae 3 mm. crassae, in statu adulto ad 290 mm. longae.

HONDURAS: El Achote, near Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5922* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia praeteruentifolia Trelease, sp. nov.—Herba modice alta adsurgens, caule basin versus 3 mm. crasso transiente puberulo, superne ramoso; folia alterna, longiora rhombico-ovata, basi et apice longe acuta, 2.5–6 cm. longa 1.5–4 cm. lata, 3-nervia vel propter costam obscure ramosam obscure 5-nervia, in sicco membranacea, plus minusve persistente sed sparse adpresso-pilosa, petiolo filiformi puberulo ad 1–3 cm. longo; spicae axillares in statu juvenili 30 mm. longae 1 mm. crassae, pedunculo filiformi puberulo 5 mm. longo, bracteis rotundo-peltatis.

HONDURAS: River bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5614* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia rhodophlebia Trelease, sp. nov.—Herba modice alta epiphytica glabra, caule 3–4 mm. crasso in sicco valde angulato; folia opposita vel ternata rhombice lanceolato-elliptica acuminata, basi cuneata, 25–40 mm. longa 15–18 mm. lata, in vivo rubro-venosa, in sicco crassa dura opaca, petiolo 5 mm. longo; inflorescentia?

HONDURAS: On a tree near Potrerillos, Department of Cortés, *Yuncker 4896* (type in herb. Univ. Illinois).

Peperomia rinconensis Trelease, sp. nov.—Herba stolonifera, ramis breviusculis foliosis minute puberulis circiter 1 mm. crassis; folia alterna subrhombeo-lanceolata, obtuse protracto-acuminata, basi acuta, 3.5 cm. longa 1.5 cm. lata 1-nervia vel obscure 3–5-nervia, in sicco opaca subtus pallidiora, petiolo 2–4 mm. longo amplexicauli-decurrente aliquanto sparse minute puberulo; spicae terminales 40–50 mm. longae 1 mm. crassae, pedunculo vix 10 mm. longo, bracteis rotundo-peltatis; ovarium apice obliquum, stigmate subapicali.

HONDURAS: On a rotten log in a wet ravine near El Rincón, west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6080* (type in herb. Univ. Illinois).

Peperomia rotundifolia (L.) HBK. On stones and trees in forest above Lancetilla Valley, 60–90 meters.

Peperomia rubefacta Trelease, sp. nov.—Herba modice alta rhizomatosa nigro-punctulata, caule 1–2 mm. crasso glabro vel superne pilis paucis sparsis onusto; folia primo crassa, lucida vel supra pilis paucis conspersa, lanceolata acuminata, basi acuta, 4–6 cm. longa 1.5–2 cm. lata, 5-nervia nervis interioribus basi aliquanto confluentibus, in sicco opaca subcoriacea, petiolo 5–10 mm. longo amplexicauli-decurrente plus minusve canaliculato, marginibus aliquanto ciliatis; spicae 100 mm. longae 2 mm. crassae, pedunculo gracili 10 mm. longo, bracteis rotundo-peltatis; baccae ovoideae apice obliquae et plus minusve rostratae, stigmate subapicali.

HONDURAS: El Rincón, west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6081* (type in herb. Univ. Illinois).

Peperomia suavis Trelease, var. **hondurensis** Trelease, var. nov.—Characteribus speciei, odorem *Zingiberis* exhalans; folia elliptico-ovata breviter acuminata, basi rotundata vel peltata, 16–19 cm. longa 10–13 cm. lata, ubique obscure nervosa, petiolo 9–12 cm. longo; spicae 220 mm. longae 3–4 mm. crassae pedunculum bibracteatum ca. 7 cm. longum solitarie terminantes; baccae rotundato-ovoideae glandulosae rostratae.

HONDURAS: Ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5878* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Peperomia subgeminispica Trelease, sp. nov.—Herba majuscula diffusa radicans glabra rupicola, caule 3–4 mm. crasso; folia alterna oblanceolato-obovata subobtuse acuminata, basi cuneata, 8.5–13 cm. longa 3.5–5.5 cm. lata, e tertio vel medio inferiore pinnatinervia, petiolo 2–3 cm. longo; spicae terminales apice pedunculi brevis geminatae 128 mm. longae 2 mm. crassae, pedunculo 1–2.5

mm. longo, bracteis rotundo-peltatis parvis; stigma prope basin scutelli longiacuminati insertum.

HONDURAS: On a rock, hills above Lancetilla Valley, at 90 meters, *Yuncker 4987* (type in herb. Univ. Illinois).

Peperomia tressis Trelease, sp. nov.—Herba modice alta repens glabra, caule 2 mm. crasso; folia alterna late elliptica ad rotundo-obovata vel subrhombeo-obovata, apice rotundata vel obtuse subacuminata, basi acuta, 2–4 cm. longa 2–2.5 cm. lata, 3-nervia vel obscure 5-nervia, subtus paullo pallidiora, in sicco chartacea, petiolo ca. 10 mm. longo; spicae ex axillis superioribus nascentes 35 mm. longae 2 mm. crassae, pedunculo ca. 5 mm. longo.

HONDURAS: In a ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6001* (type in herb. Univ. Illinois).

Peperomia Trumani Trelease, sp. nov.—Planta parva epiphytica rhizomatosa, caule filiformi, internodiis brevibus puberulis; folia inferiora rotundata vel elliptica, superiora lanceolata atque basi et apice acuta, 8 mm. longa et aequilata vel superiora 15–20 mm. longa atque 5 mm. lata, 1-nervia vel obscure 3-nervia, puberula vel glabrescentia, subtus pallida, petiolo vix 5 mm. longo; spicae terminales vix 10 mm. longae et 1 mm. crassae, pedunculo 1 mm. longo.

HONDURAS: On a rotten tree trunk near Lake Yojoa, Department of Cortés, 630 meters, *Truman G. Yuncker 4847* (type in herb. Univ. Illinois).

Peperomia yojoana Trelease, sp. nov.—Herba modice parva repens radicans glabra, caule 1–2 mm. crasso; folia alterna lanceolata ad subrhombeo-oblanceolata, apice attenuato subobtuso, basi acuta vel cuneata, 1–3.5 cm. longa 0.5–1.25 cm. lata, 1-nervia vel plus minusve obvie 3–5-nervia, coriacea et opaca, subtus flavescentia et concolore vel obscure granulosa, petiolo vix 5 mm. longo amplexicauli-decurrente; spicae vix 60–70 mm. longae et 1 mm. crassae laxiflorae, pedunculo fere 2 cm. longo, bracteis rotundo-peltatis; baccae subglobosae, stigmate in apice obliquo aliquanto acutato subapicali.

HONDURAS: Lake Yojoa, Department of Cortés, 630 meters, *Yuncker 4913* (type in herb. Univ. Illinois), *4823, 4902.*

Peperomia Yousei Trelease, sp. nov.—Herba majuscula stolonifero-adsurgens fragrans glabra, caule 4–5 mm. crasso; folia alterna elliptica vel obovata obtusa vel fere truncato-emarginulata, basi cuneata, 5–7.5 cm. longa 4–5 cm. lata graciliter pinnatinervia, in sicco coriacea, petiolo 2–3.5 cm. longo; spicae pedunculos 1–2 graciles axillares 1-bracteatos 4–5 cm. longos terminantes, initio anthesis 115 mm. longae et 2 mm. crassae, pedicellis ca. 2 cm. longis sparse minute puberulis, bracteis magnis granulosis paucis pseudo-verticillum efformantibus; baccae subcylindraceae, scutello obliquo attenuato-acuminato, stigmate subapicali.

HONDURAS: In a wet ravine near El Achote, above Siguatepeque, Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5995* (type in herb. Univ. Illinois), *6134*. Duplicate of the latter number in Herb. Field Mus.

Peperomia Yunckeri Trelease, sp. nov.—Herba modice alta sed delicata aliquanto laxe ramosa, pagina superiore folii obscure viridi excepta plus minusve rubescens, caule 1 mm. vel basin versus ad 3 mm. crasso persistente minute puberulo; folia alterna ovata vel ovali-ovata basi et apice acuta 1.5–2.5 cm. longa 1–1.5 cm. lata multiplinervia, nervis basalibus 2-jugatis, addito prope medium costae ramo alio, subtus albescentia, vulgo plicata, utrinque minute puberula vel glabrescentia, petiolo gracili ca. 10–15 mm. longo puberulo; spicae terminales et ex axillis superioribus nascentes filiformes 60–100 mm. longae laxiflorae, pedunculo ca. 5–15 mm. longo sparse puberulo; bracteae rotundo-peltatae; baccae rubrae ellipsoideae, apice conico-obliquo, stigmate subapicali.

HONDURAS: Wet soil along bank of a stream northwest of Siguatepeque, Department of Comayagua, 1,100 meters, *Yuncker, Dawson & Youse 6392* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

PIPER L.

Piper actae Trelease, sp. nov.—Frutex 2–3-metralis nervis folii subtus puberulis exceptis glaber, ramulis nigrescentibus, internodiis gracilibus modice elongatis; folia lanceolato-elliptica acute acuminata, basi subobtusa, latere altero paullo breviore, 12–13 cm. lata e medio inferiore pinnatinervia, nervis ca. 5×2, utrinque sublucida, petiolo vix 8–12 mm. longo infra medium vaginante; spicae 50 mm. longae 3 mm. crassae, pedunculo 5 mm. longo.

HONDURAS: Tela, in sandy soil along the beach, *Yuncker 4657* (type in herb. Univ. Illinois).

Piper adornatispicum Trelease, sp. nov.—Frutex 3-metralis facie *P. ornatispico* arcte similis, internodiis superioribus breviusculis gracilibus primo cinereo-tomentosis; folia elliptica vel sublanceolata acute acuminata, basi oblique subcordulata, 16 cm. longa 5.5 cm. lata, e medio inferiore pinnatinervia, nervis ca. 6×2, supra minute pubescentia serius minute granuloso-asperata, nervis subtus apicem versus puberulis sed basi pubescentibus, rugescentia, petiolo 5+3–10+5 mm. longo pubescente; spicae 100 mm. longae 4 mm. crassae, pedunculo 10 mm. longo pubescente; bracteae rotundo-subpeltatae ciliolatae subzonatae.

HONDURAS: In a ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5885* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper allatum Trelease, sp. nov.—Frutex 1.5 m. altus, internodiis superioribus subgracilibus elongatis transiente puberulis; folia lanceolata ad subrhombeo-elliptica acuminata, basi angustata obtusa atque altero vel utroque latere cordulata, 15–20 cm. longa 5.5–10 cm. lata, e medio inferiore pinnatinervia, nervis ca. 5×2, subtus plus minusve puberulis, petiolo ca. 8+2 mm. longo minute pubescente; spicae in sicco viso valde juveniles et parvae.

HONDURAS: In a ravine at El Rincón, 10 miles west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6068* (type in herb. Univ. Illinois).

Piper apertum Trelease, sp. nov.—Frutex metralis, internodiis floriferis gracilibus brevibus primo hispidis; folia subelliptica acute acuminata, basi subcordulata altero latere paulo breviore, 12–13 cm. longa 6 cm. lata, e medio inferiore pinnatinervia, nervis ca. 5×2, supra albo-granulosa, nervis subtus minute adpresso-pubescentibus, petiolo 8+2 mm. longo subhispido; spicae rectae 60 mm. longae 3 mm. crassae, pedunculo gracili fere 15 mm. longo glabrato, bracteis transverse subpeltatis ciliolatis; baccae teretes truncatae, stigmatibus 3 parvis sessilibus.

HONDURAS: Lake Yojoa, Department of Cortés, 630 meters, *Yuncker 4821* (type in herb. Univ. Illinois).

Piper apertum(?) var. **nodosum** Trelease, var. nov.—Nodosus; folia basi angustata inaequaliter cordulata, nervis subtus hispidis; inflorescentia?

HONDURAS: With the type, *Yuncker 4821* in part (type in herb. Univ. Illinois).

Piper arenicola Trelease, sp. nov.—Frutex vix 2-metralis, internodiis modicis transiente hirsutis; folia elliptica acute acuminata, basi aliquanto inaequaliter obtusa, 12–16 cm. longa 6–7 cm. lata, e medio inferiore pinnatinervia, nervis ca. 5+4, vix rugosa, supra glabra sublucida, subtus pallida subpuberula, nervis hirsutis, petiolo vix 10 vel 5+5 mm. longo subhirsuto basi vaginante; spicae vix 40 mm. longae et 3 mm. crassae, pedunculo 5 mm. longo puberulo; bracteae parvae transverse subpeltatae ciliolatae.

HONDURAS: Sandy soil, Tela to Lancetilla Valley, at 27 meters, *Yuncker 4499* (type in herb. Univ. Illinois).

Piper auritum HBK. f. **rinconense** Trelease, forma nov.—Frutex vix 1.5 m. altus, ramulis gracilibus cito glabrescentibus; folia elongato-ovata subacuta, basi oblique auriculata, petiolo latere altero paullo longiore, 22–25 cm. longa 11–12 cm. lata, nervis subtus basin versus ut petiolo subvillosis, petiolo 50+2–5 mm. longo; inflorescentia?

HONDURAS: El Rincón, Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6064* (type in herb. Univ. Illinois).

Piper auritum HBK. var. **amplifolium** C. DC. Wet ravine near El Achote, above Siguatepeque, Department of Comayagua, at 1,350 meters.

Piper calvescens Trelease, sp. nov.—Internodia florifera subgracilia brevia glabra; folia ovata subacute acuminata, basi rotundata vel acute contracta, modice parva 10–13.5 cm. longa 5–8 cm. lata, palmatim 5-nervia vel obscure 7-nervia, nervis prope basin aliquanto pubescentibus, petiolo brevi 5–10 vel ad 15 mm. longo, primo aliquanto villoso glabrescente; spicae oppositifoliae graciles sed sublongae 60–70 mm. longae 3–4 mm. crassae, pedunculo gracillimo brevi 10 mm. longo sed petiolum oppositum superante aliquanto pubescente; bracteae subpeltatae ciliolatae; flores sessiles perfecti; ovarium glabrum, stigmatibus 3 sessilibus.

HONDURAS: San Pedro Sula, Department of Santa Bárbara, *Thieme 5461* (type in U. S. Nat. Herb. No. 796,474 and, in part, No. 796,493).

Piper calvescens var. **pedunculatum** Trelease, var. nov.—Folia rotundo-elliptica subabrupte breviter acuminata, basi acuta, 13–14 cm. longa 9–10 cm. lata, 7-nervia, petiolo et pedunculo 10–15 mm. longis; spicae in statu fructifero 75 mm. longae 5 mm. crassae.

HONDURAS: Potrerillos, Department of Cortés, *Yuncker 4882* (type in herb. Univ. Illinois).

Piper calvescens var. portrerillosense Trelease, var. nov.—Gracilis nodosus nigrescens essentialiter glaber; folia elliptica graciliter acuminata, basi acuta, 7–10 cm. longa 4–6 cm. lata, 5-nervia, petiolo 5–10 mm. longo; spicae 50–70 mm. longae 5 mm. crassae densiflorae, pedunculo 5 mm. longo; bracteae subcrescenticae griseae; baccae ovoideae, stigmatibus parvis erectis.

HONDURAS: Potrerillos, Department of Cortés, *Yuncker 4894* (type in herb. Univ. Illinois).

Piper comayaguanum Trelease, sp. nov.—Frutex 2-metralis, internodiis gracilibus cito elongatis sordido-villosis; folia rotundo-ovata aromatica acuminata, basi rotundata vel inferiora cordata, 12–19 cm. longa 9–14 cm. lata, 5 7-nervia, primo supra pubescentia, nervis subtus pallidis hispidis, petiolo 10–15 mm. longo vel in foliis inferioribus ad 28 mm. subvilloso; spicae in siccis juveniles, pedunculo sordido-subvilloso.

HONDURAS: River bank about 6 km. north of Siguatepeque, Department of Comayagua, 1,300 meters, *Yuncker, Dawson & Youse 6310* (type in herb. Univ. Illinois).

Piper cristicola Trelease, sp. nov.—Frutex vel suffrutex 2-metralis, internodiis floriferis subgracilibus sed elongatis hirtellis sed ad et infra nodos glabrescentibus; folia ovata obtuse sed apiculate breviacuminata, basi fere aequilaterali cordata, 33 cm. longa 19–20 cm. lata, e tertio infimo subpinnatinervia, nervis longioribus ca. 6×2, intermediis interpositis, supra glabra viridia lucida, subtus pallidiora primo ad nervos hirtella, petiolo 5 cm. longo rigido-hirtello; inflorescentia?

HONDURAS: In forest at summit of the range above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6247* (type in herb. Univ. Illinois).

Piper Dawsoni Trelease, sp. nov.—Frutex vix 2-metralis, ramis gracilibus, internodiis elongatis evanescente villosis; folia lanceolata sensim subacuminata, basi obtusa, 10–19 cm. longa 3–4 cm. lata, e medio inferiore pinnatinervia, nervis 4–5×2, supra basibus pilorum brevium granuloso-scabra, subtus ad nervos subvillosa, petiolo 5 mm. longo subvilloso; spicae rectae apiculatae 80 mm. longae 3 mm. crassae, pedunculo 10 mm. longo villoso; bracteae rotundo-subpeltatae ciliatae.

HONDURAS: In a ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6283* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper Deamii Trelease, sp. nov.—*P. decrescens* var. *ovatum* C. DC. in DC. Prodr. 16, pt. 1: 251. 1869. Frutex ca. 2-metralis velutino-hirsutus, internodiis floriferis gracilibus brevibus; folia rotundo-ovata breviter acuminata, basi aperte cordata et intra sinum breviter cuneata, 8–10 cm. longa 6–8 cm. lata, 7–9-nervia, petiolo 10 mm. longo; spicae ca. 30 mm. longae et 2 mm. crassae, pedunculo 5 mm. longo.

NICARAGUA: "Guatemala," *Friedrichstahl* (type in Herb. Kew.); also in herb. Mus. Vienna as *No. 905*, from Granada. Known also from Salvador. [The locality is evidently Nicaraguan rather than Guatemalan, as listed in Dr. Trelease's original manuscript. Apparently all the Friedrichsthal plants at Vienna are labeled as from Guatemala, but fortunately the locality name usually is written on the label, from which it appears that a large number if not the majority of them are really from Nicaragua and Costa Rica.—P. C. Standley.]

Piper Deamii var yojoanum Trelease, var. nov.—Frutex nodosus 2-metralis, internodiis floriferis subgracilibus brevibus primo minute crispo-pubescentibus; folia ovata acuminata, basi cordulata vel breviter cordata, 7.5–9 cm. longa 4.5–5.5 cm. lata, 7-nervia, nervis praesertim subtus hirtellis, petiolo 10 mm. longo crispo-hirtello; spicae 35 mm. longae 5 mm. crassae, pedunculo 10 mm. longo plus minusve hirtello; baccae ovoideae, stigmatibus brevibus.

HONDURAS: Paral, Lake Yojoa, 630 meters, *Yuncker 4875* (type in herb. Univ. Illinois).

Piper deltoideocarpum Trelease, sp. nov.—Frutex 3-metralis, internodiis superioribus subgracilibus brevibus breviter molliter pubescentibus; folia ovata sensim subacuminata, basi paullo inaequilatera obtusa, ca. 16 cm. longa et 9 cm. lata, e tertio infimo pinnatinervia, nervis ca. 5×2, supra primo minute pubescentia serius paullo asperata, nervis subtus crispo-puberulis, petiolo 1–2 cm. longo; spicae 80 mm. longae 3 mm. crassae, pedunculo 5 mm. longo; aliquanto pubescente; bracteae triangulari-subpeltatae ciliatae; baccae plus minusve acute triquetrae.

HONDURAS: River bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5654* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper epilosipes Trelease, sp. nov.—Frutex nodosus glaber vix 2-metralis facie spec. *P. atrichopus* similis, internodiis superioribus brevibus gracilibus; folia anguste lanceolata sensim attenuata, basi angustata obvie obtusa, 10–12 cm. longa 3–4 cm. lata, e tertio infimo pinnatinervia, nervis longioribus 3×2, nervis brevibus sursum curvis fere ad apicem insertis, in sicco chartacea et paullo undata, petiolo 5 mm. longo vel in foliis inferioribus 10 mm. longo; spicae 40 mm. longae 2 mm. crassae, pedunculo 5 mm. longo; bracteae subcrescenticae; baccae depressae subrotundae, stigmatibus sessilibus.

HONDURAS: In a ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6296* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper epilosipes var. **heterophyllum** Trelease, var. nov.—Folia majora, 12–15 cm. longa 3–4 cm. lata, inferiora ovata atque 10 cm. longa et 4 cm. lata, petiolis infimis 15 mm. longis; spicae 50 mm. longae 3 mm. crassae, pedunculo 5–10 mm. longo.

HONDURAS: With the type, *Yuncker, Dawson & Youse 6097* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper exigens Trelease, sp. nov.—Frutex glaber vix 2.5 m. altus, internodiis superioribus gracilibus breviusculis; folia lanceolato-ovata acuminata, basi subobliqua acuta vel abrupte acutiuscula, 16–19 cm. longa 7.5–8 cm. lata, multiplinervia, nervis basalibus 2 paribus, utroque latere infra tertium supremum nervis 3 separatis additis, lucida, subcoriacea, petiolo 15 mm. longo; spicae 100 mm. longae 3 mm. crassae, pedunculo 10 mm. longo.

HONDURAS: Ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6124* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper exigens var. **subovatum** Trelease, var. nov.—Folia elongato-ovata ad 20 cm. longa atque 8.5 cm. lata, vel late ovata atque 9–12 cm. lata; spicae 110 mm. longae.

HONDURAS: With the type, *Yuncker, Dawson & Youse 5997* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper faviculiferum Trelease, sp. nov.—Pl. XI. Frutex aliquanto nodosus 1.5 m. altus, internodiis subgracilibus elongatis subpersistente molliter cinereo-pubescentibus; folia ovata subacuminata, basi breviter cordata, 12–20 cm. longa 6–13 cm. lata infra tertium supremum pinnatinervia, nervis ca. 6–7×2, bullato-alveolata, supra granuloso-scabra, nervis subtus breviter pubescentibus, petiolo 15–20 mm. longo griseo-pubescente; spicae paullo curvae 75 mm. longae 2 mm. crassae, pedunculo 8 mm. longo; bracteae subcrescenticae dense pilosae.

HONDURAS: Ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6368* (type in herb. Univ. Illinois).

Piper firmifolium Trelease, sp. nov.—Frutex nodosus glaber 3–4-metralis, internodiis superioribus brevibus gracilibus; folia lanceolata obtuse subacuminata, basi acuta, 6–8 cm. longa 2–3.5 cm. lata, saliente 3-nervia, foliis interdum ovatis, basi rotundato-cordatis, 8 cm. longis, 4 cm. latis atque 5-nervis, subtus paullo pallidiora, in sicco firma, petiolo 3 mm. longo; spicae vix 50 mm. longae atque 2 mm. crassae, pedunculo 5–10 mm. longo; bracteae rotundo-subpeltatae lanosae; baccae rotundae, stigmatibus sessilibus.

HONDURAS: Near El Rincón, about 10 miles west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6048* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper fraguanum Trelease, var. **viride** Trelease, var. nov.—Folia 17–21 cm. longa 8–11 cm. lata subtus laete viridia; spicae 75 mm. longae 4 mm. crassae.

HONDURAS: Lancetilla Valley, at 27 meters, *Yuncker 4918* (type in herb. Univ. Illinois).

Piper inconsumptum Trelease, sp. nov.—Frutex 2–3-metralis glaber vel in nervis paginae inferioris folii puberulus, internodiis breviusculis gracilibus; folia lanceolato-elliptica plus minusve falcate breviacuminata, basi acuta latere altero solemniter breviore, 16–18 cm. longa 6–7 cm. lata, infra tertium supremum pinnatinervia, nervis 5×2, subtus pallidiora, petiolo fere 15+5 mm. longo basi tantum vaginante; spicae suberectae 90–125 mm. longae 3–4 mm. crassae pallido-zonatae, pedunculo 10 mm. longo; bracteae crescenticae vel triangulari-subpeltatae ciliolatae; baccae subteretes truncatae, stigmatibus parvis sessilibus.

HONDURAS: Forest near Paral, Lake Yojoa, Department of Cortés, 630 meters, *Yuncker 4871* (type in herb. Univ. Illinois), *4874*.

Piper laceratibracteum Trelease, sp. nov.—Frutex glaber nodosus ca. 2-metralis, ramis nigrescentibus, internodiis gracilibus striatis cito elongatis; folia lanceolata obtuse subacuminata, basi acuta, 9–10.5 cm. longa 3.5–5 cm. lata, 3-nervia vel obscurissime 5-nervia, subtus paullo pallidiora, in sicco crasse papyracea, petiolo vix 5 mm. longo; spicae 50–90 mm. longae 2 mm. crassae, pedunculo filiformi 10 vel usque ad 25 mm. longo; bracteae triangulari-subpeltatae, medio fuscae, margine lacerato pallido; ovarium depressum, stigmatibus sessilibus.

HONDURAS: Ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6226* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper laedans Trelease, sp. nov.—Frutex 1.5 m. altus, ramis geniculatis nodosis, internodiis brevibus gracilibus primo valde ferrugineo-villosis; folia lanceolata anguste acuminata, basi angustata obtusa latere altero breviore, 13–17 cm. longa 4.5–5.5 cm. lata, e medio inferiore pinnatinervia, nervis 4+3, albido-granuloso-scabra, nervis subtus villosis, petiolo 5–7+3 mm. longo villoso; spicae 60 mm. longae 3 mm. crassae fere rectae, pedunculo 10 mm. longo ferrugineo-villoso.

HONDURAS: Ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5821* (type in herb. Univ. Illinois).

Piper monteluctans Trelease, sp. nov.—Frutex humilis plus minusve caespitosus glaber, internodiis superioribus gracillimis breviusculis; folia late lanceolata obtuso-acuminata, basi uno latere obtusa altero acute protracta, 12–16 cm. longa 4–6 cm. lata, e medio inferiore pinnatinervia, nervis ca. 4×2, in sicco tenuia viridia, petiolo 3–5+2 mm. longo; inflorescentia?

HONDURAS: Creeping over logs in forest, cloud zone on range above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6176* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium Mart. & Gal. *Artanthe Galeottii* Miq.; *P. aduncum, P. angustifolium, P. elongatum* of authors, as to Mexico and northern Central America; *P. xanthocladum* Trelease ex Standl. & Calderón, Lista Pl. Salv. 62. 1925, nomen. River bank, vicinity of Siguatepeque, 1,050 meters; also at 1,200 meters.

Piper multinervium var. **amplum** Trelease, var. nov.—Frutex evanescente puberulus; folia elliptico-lanceolata vix cordulata, 20 cm. longa 8 cm. lata, petiolo ca. 5+3 mm. longo; spicae curvae 90 mm. longae 2–3 mm. crassae, pedunculo 8–10 mm. longo.

GUATEMALA: La Libertad, Petén, *Lundell 2556* (type in herb. Univ. Michigan).

Piper multinervium var. **cayoense** Trelease, var. nov.—Frutex 1.5 m. altus persistente aliquanto puberulus; folia elliptico-lanceolata acuminata, basi inaequaliter cordulata, 18 cm. longa 6–7 cm. lata, petiolo 3+2 mm. longo; spicae curvae fere 150 mm. longae 2–3 mm. crassae, pedunculo ca. 10 mm. longo.

BRITISH HONDURAS: El Cayo, *H. H. Bartlett 11570* (type in herb. Univ. Michigan).

Piper multinervium var. **flavicans** Trelease, var. nov.—Frutex nodosus 3-metralis, internodiis in statu juvenili brevibus et modice gracilibus rubescentibus dense velutinis; folia lanceolata sensim longiattenuata, basi inaequaliter obtusa, latere longiore ad petiolum acute decurrente, ca. 10–12 cm. longa atque 4 cm. lata, nervis adpresso-puberulis, petiolo 4+4 mm. longo primo velutino; spicae curvae 90 mm. longae 3 mm. crassae, pedunculo 15 mm. longo glabro.

HONDURAS: Siguatepeque, Department of Comayagua, 1,200 meters, *Yuncker, Dawson & Youse 5859* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium var. **hirsuticaule** Trelease, var. nov.—Frutex 4-metralis, ramulis primo molliter hirsutis; folia lanceolata acute acuminata, basi paullo obliqua cordulata, 15–20 cm. longa 4.5–5.5 cm. lata, petiolo 5+1 mm. longo molliter piloso; spicae curvae 50 mm. longae 2 mm. crassae, pedunculo 15 mm. longo sparse velutino.

HONDURAS: Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5724* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.); also, at 1,200 meters, *No. 5699*.

Piper multinervium var. **kantelolense** Trelease, var. nov.—Frutex valde nodosus transiente aliquanto puberulus, internodiis brevibus; folia lanceolata acuminata, basi inaequaliter obtusa vel subcordulata, 13–15 cm. longa 4–5 cm. lata, petiolo ca. 4+4 mm. longo; spicae curvae 100 mm. longae 2–3 mm. crassae, pedunculo 10 mm. longo.

GUATEMALA: La Libertad, Petén, *Lundell 3008* (type in herb. Univ. Michigan). Also at Kantelol, *Lundell 3168*.

Piper multinervium var. **paralense** Trelease, var. nov.—Arbuscula nodosa 5-metralis, trunco basi 5 cm. diam., ramulis evanescente puberulis serius minute infra nodos granulosis; folia elliptico-lanceolata graciliter acuminata, basi uno latere tantum cordulata, 15–19 cm. longa 5–6 cm. lata, petiolo 3+3 mm. longo; spicae curvae 110 mm. longae 3 mm. crassae, pedunculo 10–55 mm. longo glabrato.

HONDURAS: Paral, Lake Yojoa, Department of Cortés, 630 meters, *Yuncker 4877* (type in herb. Univ. Illinois).

Piper multinervium var. **peracutum** Trelease, var. nov.—Frutex 2 3-metralis transiente velutinus, nodis denudatis minute granulosis; folia late lanceolata vel elliptico-lanceolata sensim longiacuminata, basi inaequaliter cordulata, 20 cm. longa 7 7.5 cm. lata, petiolo 4+3 mm. longo; spicae curvae 100 mm. longae 2 mm. crassae, pedunculo 12 mm. longo glabrato.

HONDURAS: Lancetilla Valley, near Tela, Department of Atlántida, 20-600 meters, *Paul C. Standley 54921* (type), *53083*.

Piper multinervium var. **productipes** Trelease, var. nov.—Frutex nodosus 3-metralis transiente aliquanto velutinus; folia lanceolata acuminata, basi inaequilaterali latere longiore ut in typo subauriculato-cordulato, 17 cm. longa 5.5 cm. lata; spicae curvae 90-100 mm. longae 3 mm. crassae, pedunculo 15 mm. longo.

HONDURAS: Ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5819* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium var. **protractifolium** Trelease, var. nov. —Frutex vix 3-metralis, ramulis glabratis purpurascentibus; folia elliptica atque 15 cm. longa et 5.5 cm. lata, vel elongata, 18 cm. longa 5 cm. lata, acute acuminata, basi subobtusa latere altero breviore, nervis subtus aliquanto tomentulosis, petiolo 3+3 mm. longo glabrato; spicae curvae 100 mm. longae 2 mm. crassae, pedunculo gracili 15 mm. longo glabrato.

HONDURAS: Pine forest above Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5668* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium var. **puberulipedunculum** Trelease, var. nov.—Frutex altus 5-metralis, trunco 7.5 cm. diam., ramulis transiente adpresso-pilosis; folia subovato-lanceolata acuminata, basi obliqua obtusa latere breviore subcordulato, 14 19 cm. longa 5-7 cm. lata, nervis puberulis, petiolo ca. 3+3 mm. longo glabrato; spicae curvae vix 90 mm. longae et 2 mm. crassae, pedunculo gracili velutino 6-10 mm. longo.

HONDURAS: El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5876* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium var. **pubescenticaule** Trelease, var. nov.—Arbor 10-metralis in statu juvenili rubescens, ramulis primo dense subtomentosis; folia elongato-lanceolata acuminata basi oblique subacuta, 12–20 cm. longa 4–6 cm. late, aliquanto rugescentia, nervis subtus prominentibus puberulis, petiolo 5+2 mm. longo; spicae ca. 50 mm. longae et 2 mm. crassae, pedunculo velutino 10 mm. longo.

HONDURAS: Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5731* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper multinervium var. **Skutchii** Trelease, var. nov.—Frutex 5-metralis evanescente sparse sericeus; folia late lanceolata 17–26 cm. longa 5.5–7.5 cm. lata basi inaequaliter cordulata, petiolo vix 3+3 mm. longo; spicae 90 mm. longae 2–3 mm. crassae, pedunculo 15 mm. longo.

GUATEMALA: Colomba, Department of Quezaltenango, 900 meters, *A. F. Skutch 1299.*

Piper multinervium var. **tamashense** Trelease, var. nov.—Frutex 2-metralis, trunco 3 cm. crasso, evanescente puberulus; folia lanceolata vel elliptico- vel subovato-lanceolata acuminata, basi inaequaliter cordulata, 15–18 cm. longa 4.5–7 cm. lata, petiolo ca. 5+5 mm. longo; spicae in sicco viso juveniles et brevipedunculatae.

BRITISH HONDURAS: Tamash River, 30 meters, *W. A. Schipp 1382.*

Piper multinervium var. **telanum** Trelease, var. nov.—Frutex 2–3-metralis subpersistente puberulus; folia late lanceolata vel elliptico-lanceolata acuminata, basi inaequaliter cordulata, 16–18 cm. longa 5–6.5 cm. lata subrugescentia, petiolo ca. 3+3 mm. longo glabrato; spicae curvae 90 mm. longae 2–3 mm. crassae, pedunculo 10 mm. longo puberulo.

HONDURAS: Tela, Department of Atlántida, 20–600 meters, *Paul C. Standley 53264* (type in Herb. Field Mus.); Tela River, *Yuncker 4512;* Tela to Lancetilla Valley, 30 meters, *Yuncker 4498* (folia 16 cm. tantum longa).

Piper mystaciferum Trelease, sp. nov.—Frutex 2-metralis, internodiis superioribus modice gracilibus et elongatis primo dense curvo-pilosis; folia lanceolata sensim subacuminata, basi obtusa latere altero breviore, 15–18 cm. longa 5–6 cm. lata e medio inferiore pinnatinervia, nervis 4×2 venis transversis connexis, supra dense adpresso-pubescentia et asperata, costa barbata, petiolo ca. 6+4 mm.

longo piloso; spicae in sicco viso juveniles atque 35 mm. longae, 2 mm. crassae, pedunculis pilosis 10 mm. longis.

HONDURAS: Ravine at El Rincón, 10 miles west of Siguatepeque, Department of Comayagua, 1,300–1,400 meters, *Yuncker, Dawson & Youse 6054* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper nubigaudens Trelease, sp. nov.—Frutex vix 3-metralis, internodiis superioribus gracilibus substrigosis brevibus; folia lanceolata sensim acuminata, basi paullo inaequilaterali obtusa, 9–11 cm. longa 3.5–4 cm. lata, e medio inferiore pinnatinervia, nervis ca. 3×2, glabra, in sicco chartacea fragrantia, petiolo vix 5 mm. longo substrigoso; spicae 55 mm. longae 3–4 mm. crassae, pedunculo ca. 7 mm. longo; bracteae crescenticae; baccae depressae cum rhachi elongatae, stigmatibus sessilibus.

HONDURAS: Cloud zone forest above El Achote, near Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 5991* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper ornatispicum Trelease, sp. nov.—Frutex 3-metralis, internodiis floriferis breviusculis modice crassis primo griseo-tomentosis; folia elliptica subacuminata, basi inaequilateralia uno latere obtusa, 14–16 cm. longa 7–8 cm. lata, e medio inferiore pinnatinervia, nervis 5×6, primo supra minute pubescentia serius granuloso-asperata, subtus puberula, non rugosa, petiolo 10 mm. vel 15+5 mm. longo primo pallido-tomentoso; spicae 80 mm. longae 3 mm. crassae, pedunculo 5 mm. longo pubescente; bracteae triangulari-subpeltatae pallidae, ovariis fuscis.

HONDURAS: Thicket on river bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5618* (type in herb. Univ. Illinois).

Piper paludicola Trelease, sp. nov. Frutex 3-metralis inferne nodosus, internodiis floriferis brevibus modice gracilibus primo molliter pilosis serius breviter velutinis; folia lanceolato-elliptica vel ovato-elliptica acute acuminata, basi aliquanto inaequaliter cordulata, 11–17 cm. longa 5–7 cm. lata, e medio inferiore pinnatinervia, nervis 4–5×2, aliquanto rugosa, supra valde lucida obscure viridia glabra, subtus pallidiora subpuberula, nervis breviter hirsutis, petiolo 10–15 mm. longo subhirsuto infra medium vaginante; spicae 50–60 mm. longae 3–4 mm. crassae, pedunculo 5 mm. longo glabrato; baccae rotundae griseae.

HONDURAS: In marsh near Tela, Department of Atlántida, *Yuncker 4977* (type in herb. Univ. Illinois).

Piper petens Trelease, sp. nov.—Frutex paullo plus quam 2 m. altus petiolis et nervis subtus obscure puberulis exceptis glaber, internodiis gracilibus primo brevibus; folia elongato-elliptica acute acuminata, basi paullo inaequilateralia et vulgo acuta, 11–18 cm. longa 5.5–7 cm. lata e medio inferiore pinnatinervia, nervis 5+4, in sicco papyracea, petiolo 10+3 mm. longo; spicae in sicco viso juveniles vix 10 mm. longae et 1 mm. crassae apiculatae griseae breviter pedunculatae.

HONDURAS: Ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6107* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper pictamentum Trelease, sp. nov.—Frutex nodosus 1–2-metralis, internodiis crassis brevibus pallidis pallido-tomentosis; folia elliptica vel oblongo-elliptica acuta, basi inaequaliter cordulata, 6–12.5 cm. longa 3–5.5 cm. lata, supra manifeste granulosa, subtus ad nervos pallido-villosa, e medio inferiore pinnatinervia, nervis 6×2, petiolo 5 mm. longo tomentoso-subvilloso; spicae rectae vel curvae 80 mm. longae 3 mm. crassae, pedunculo 10 mm. longo tomentoso; bracteae rotundo-subpeltatae ciliatae pallidae et manifeste ut in *P. Yunckeri* zonatae.

HONDURAS: Rocky hillside, Siguatepeque, Department of Comayagua, 1,100 meters, *Yuncker, Dawson & Youse 5902* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper pictamentum var. **fluminis** Trelease, var. nov.—Forma multo gracilior minus tomentosa, aliter ut in forma typica speciei.

HONDURAS: River bank, Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5718* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper praemollitum Trelease, sp. nov.—Frutex vix 3-metralis, internodiis superioribus gracilibus brevibus primo tomentulosis; folia ovato-elliptica acuminata, basi rotundata altero latere paullo majore, 15–17 cm. longa 6.5–9 cm. lata e medio inferiore pinnatinervia, nervis ca. 6+5, supra puberula, subtus pallidiora aliquanto tomentulosa, petiolo ca. 10+2 mm. longo tomentuloso; spicae 70 mm. longae 2 mm. crassae, pedunculo vix 5 mm. longo puberulo.

HONDURAS: Near shore of Lake Yojoa, Department of Cortés, 680 meters, *Yuncker 4825* (type in herb. Univ. Illinois).

Piper rinconense Trelease, sp. nov.—Frutex vix 3-metralis, faciem *P. Yousei* simulans, internodiis superioribus subgracilibus brevibus primo subsericeis non nigrescentibus; folia elliptica vel sublanceolata acuminata, basi inaequilaterali altero vel ambobus lateribus rotundata, 14–15 cm. longa 6 cm. lata e medio inferiore pinnatinervia, nervis 5+6, subtus puberula, petiolo 5–7+3 mm. longo aliquanto pubescente; spicae in sicco viso juveniles vix 15 mm. longae et 2 mm. crassae, pedunculo curvo glabrato vix 5 mm. longo.

HONDURAS: Ravine near El Rincón, about 10 miles west of Siguatepeque, Department of Comayagua, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6052* (type in herb. Univ. Illinois).

Piper roseovenulosum Trelease, sp. nov.—Frutex vix 3-metralis, internodiis floriferis graciusculis brevibus primo griseo-pubescentibus cito glabrescentibus; folia lanceolato-elliptica subfalcate longiacuminata, basi inaequilateralia latere breviore saepe acuto, 10–15 cm. longa 4–8 cm. lata e medio inferiore pinnatinervia, nervis 4×2, subtus griseo-pubescentia, supra lepidoto-asperata et subtus scabrida, aliquanto rugosa, subtus pallidiora, venis in vivo roseis, petiolo ca. 6+4 mm. longo griseo-subscabrido; spicae 70 mm. longae 3 mm. crassae, pedunculo vix 10 mm. longo scabrido.

HONDURAS: Near Paral, shore of Lake Yojoa, Department of Cortés, 630 meters, *Yuncker 4873* (type in herb. Univ. Illinois).

Piper scabriseptum Trelease, var. **reductum** Trelease, var. nov.—Caule magis glabrescente; folia 12–14 cm. longa 5.5–7 cm. lata, petiolo ad 10 mm. longo.

HONDURAS: Lancetilla Valley, Department of Atlántida, 27 meters, *Yuncker 4773* (type in herb. Univ. Illinois).

Piper scalarispicum Trelease, sp. nov.—Frutex subnodosus ramulosus vix 2-metralis, internodiis floriferis graciusculis brevibus primo velutinis; folia anguste lanceolata longiattenuata, basi plus minusve obtusa, 10–13 cm. longa 3–3.5 cm. lata e medio inferiore pinnatinervia, nervis longioribus ca. 3×2, subtus crispo-velutina, petiolo vix 5 mm. longo; spicae 60–80 mm. longae 4 mm. crassae, pedunculo 10 mm. longo puberulo; bracteae triangulari-subpeltatae ciliatae scalariformi-zonatae; baccae depressae rotundatae cum rhachi elongatae, stigmatibus sessilibus.

HONDURAS: Cloud zone at summit of the range above El Achote, near Siguatepeque, Department of Comayagua, 1,800–2,000 meters, *Yuncker, Dawson & Youse 6156* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper siguatepequense Trelease, sp. nov.—Frutex divaricate ramosus 2.5 m. altus, internodiis superioribus gracilibus breviusculis persistente molliter velutinis; folia elliptico- vel rhombeo-subobovata acute acuminata, plerumque basi obtusa, 8–10 cm. longa 4.5–5 cm. lata 5-nervia, supra plus minusve persistente minute pubescentia, subtus pallidiora ad nervos velutina, petiolo vix 10 mm. longo velutino; spicae curvae 70 mm. longae 3 mm. crassae, pedunculo 5 mm. longo velutino; bracteae subcucullatae pilosae; baccae ovoideae, stigmatibus sessilibus.

HONDURAS: River bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 6042* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper siguatepequense var. **subrhombifolium** Trelease, var. nov.—Folia rhombeo-ovata 12–13 cm. longa 6–7 cm. lata basi subtruncata; spicae 80 mm. longae.

HONDURAS: Region of the type, *Yuncker, Dawson & Youse 5617* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper tenuiculispicum Trelease, sp. nov.—Arbuscula 5-metralis, internodiis floriferis breviusculis gracilibus primo breviter pubescentibus nodis exceptis glabrescentibus; folia elliptica graciliter acuminata, basi obtusa latere altero paullo breviore, 13–17 cm. longa 5.5–9.5 cm. lata e medio inferiore pinnatinervia, nervis ca. 5+6, manifeste scabrida, nervis subtus ferrugineo-substrigosis, petiolo vix 10 mm. longo hispido; spicae 60 mm. longae 2 mm. crassae, pedunculo 5–6 mm. longo hispido.

HONDURAS: Bank of Tela River above Lancetilla Valley, Department of Atlántida, 27 meters, *Yuncker 4509* (type in herb. Univ. Illinois).

Piper tesseraespicum Trelease, sp. nov.—Frutex 3-metralis, ramulis ut petiolis nervisque subtus puberulis, internodiis floriferis gracilibus subelongatis; folia subrhombeo-obovata vel elliptica obtuso-acuminata, basi obtusa latere altero breviore, 24 cm. longa 13 cm. lata e medio inferiore pinnatinervia, nervis 5+6, in sicco tenuia viridia venosa minute granuloso-asperata, petiolo ca. 15+3 mm. longo; spicae 60 mm. longae 3 mm. crassae, bracteis deltoideis manifeste pilosis, pedunculo ca. 5 mm. longo; baccae triquetrae.

HONDURAS: River bank near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 5662* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper viae-marginis Trelease, sp. nov.—Frutex nodulosus ramosus 2-metralis, internodiis superioribus gracilibus breviter albido-tomentosis; folia late vel subrhombice elliptica obtuse acuminata, basi inaequaliter subcordulata, 9–15 cm. longa 4.5–7 cm. lata e medio inferiore pinnatinervia, nervis 4–5×2, utrinque puberula, subtus pallidiora et primo albo-tomentulosa, subrugulosa, petiolo 10–15 mm. longo; spicae 60 mm. longae 4 mm. crassae, pedunculo 5 mm. longo velutino; bracteae subcrescenticae ciliatae; baccae triquetrae truncatae, stigmatibus sessilibus.

HONDURAS: Side of trail, near Siguatepeque, Department of Comayagua, 1,050 meters, *Yuncker, Dawson & Youse 6044* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper Yousei Trelease, sp. nov.—Frutex glaber vix 2-metralis, internodiis floriferis gracilibus brevibus sed cito elongantibus nigrescentibus; folia subelliptica acuminata, basi oblique acuta, 9–14 cm. longa 5.5–6.5 cm. lata e medio inferiore pinnatinervia, nervis 4×2, in sicco papyracea, subtus pallidiora, petiolo 5 vel 5+3–5 mm. longo; spicae in sicco viso juveniles vix 10 mm. longae et 1 mm. crassae pendulae, pedunculo minus quam 5 mm. longo.

HONDURAS: El Achote near Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 5999* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.). El Rincón, 1,400–1,500 meters, *Yuncker, Dawson & Youse 6070.*

Piper Yunckeri Trelease, sp. nov.—Frutex nodosus ramosissimus 1.5 m. altus, internodiis brevibus crassis pallidis persistente tomentulosis; folia subelongato-elliptica acuta basi cordulata 9–10 cm. longa 3.5–4 cm. lata e medio inferiore pinnatinervia, nervis ca. 5×2, utrinque tomentulosa vel glabrescentia, petiolo 5 mm. longo tomentuloso; spicae rectae vel curvae 60–110 mm. longae 3 mm. crassae, pedunculo 10 mm. longo puberulo; bracteae conspicuae rotundo-subpeltatae, margine pallido ciliato; baccae rotundatae, stigmatibus sessilibus.

HONDURAS: Subalpine bog near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6331* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Piper Yunckeri var. latum Trelease, var. nov.—Forma humilis immatura vix metralis, foliis inferioribus latioribus.

HONDURAS: With the type, *Yuncker, Dawson & Youse 6333* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

CHLORANTHACEAE

HEDYOSMUM Sw.

Hedyosmum Artocarpus Solms. A tree 6–7.5 meters tall and 12–15 cm. in diameter; aromatic. In a wet ravine near El Achote. The tree is new to the flora of Honduras.

MYRICACEAE

MYRICA L.

Myrica mexicana Willd. A shrub about 1 meter tall, aromatic. Edge of a ravine near El Achote.

BETULACEAE

OSTRYA (Michx.) Scop.

Ostrya virginiana var. **guatemalensis** (Winkl.) Macbr. A tree about 9 meters tall and 15 cm. in diameter. Ravine near El Achote.

FAGACEAE

QUERCUS L.

Quercus achoteana Trelease, sp. nov.—*Leucobalanos-Macrophyllae*(?). Ramuli crassiusculi 4–5 mm. crassi substriati glabrescentes grisei, lenticellis pallidis; gemmae ovoideae magnae glabrae lucidae rubescentes; stipulae plus minusve persistentes setaceae; folia decidua subobovata obtusa basi cordulata mucronulato-crenata 16 cm. longa 8 cm. lata, supra viridia glabra, subtus cito glabrescentia, nervis 12–13×2 non arcuato-conjunctis; petiolus glabrescens brevis crassus; flores et fructus?—A small tree, 5 meters tall, the trunk 15 cm. in diameter.

HONDURAS: In pine-oak association near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6136* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus achoteana var. **sublanosa** Trelease, var. nov.—Ramuli et praesertim folia subtus subpersistente ferrugineo-tomentosa; folia obovata vel subpandurate elongata apiculato-crenata 9–18 cm. longa 5–10 cm. lata obtusa, basi cordulata.—A small tree, 5 meters tall, the trunk 10 cm. in diameter.

HONDURAS: Thicket on plain, Siguatepeque, Department of Comayagua, 1,000–1,100 meters, *Yuncker, Dawson & Youse 5961* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus amissaeloba Trelease, sp. nov.—*Erythrobalanos-Perseaefoliae*(?). Ramuli graciusculi 2–3 mm. crassi striati, primo subgrisei serius fuscescentes et punctis minutis albis conspersi; folia persistentia chartacea praesertim subtus lucida, late obovata et 6.5 cm. longa, 4 cm. lata, vel suboblonga et 9–12 cm. longa 3.5–5 cm. lata, obtusa, paullo crispata, integra vel interdum apice bilobulata, basi subacuta vel subcordulata, petiolo vix 5 mm. longo; inflorescentia?—A small, glabrous tree 6 meters tall, the trunk 10–15 cm. in diameter.

HONDURAS: In ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6379* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus Dawsoni Trelease, sp. nov.—*Erythrobalanos-Acutifoliae*(?). Ramuli graciles 2–3 mm. crassi vix striati transiente aliquanto velutini; gemmae juveniles subglobosae glabratae; stipulae caducae; folia decidua oblanceolata acuminata, ad petiolum gracilem longiattenuata, 15–17 cm. longa 5 cm. lata, in fere toto margine cuspidato-serrata, cito glabrescentia et lucida, nervis 10–12×2, petiolo 1–2 cm. longo; inflorescentia?—A small tree, 3 meters tall, the trunk 7–8 cm. in diameter.

HONDURAS: In ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6378* (type in herb. Univ. Illinois).

Quercus perseaefolia(?) Liebm. var. **achoteana** Trelease, var. nov.—*Erythrobalanos-Perseaefoliae*. Glabra; ramuli 2–3 mm. crassi grisei inconspicue lenticellati; gemmae rotundatae vel ovoideae 2–3 mm. longae 2 mm. crassae; folia persistentia suboblonga utrinque subacuta vel obtusa et basi aliquanto inaequaliter obtusa, 7–15 cm. longa 3–4 cm. lata, integra chartacea subcrispata paullo lucida, petiolo vix 5 mm. longo; inflorescentia?—A small tree, 4 meters tall, the trunk 5–7 cm. in diameter.

HONDURAS: In thicket west of El Achote, above Siguatepeque, Department of Comayagua, 1,300 meters, *Yuncker, Dawson & Youse 6203* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus pertessellata Trelease, sp. nov.—*Erythrobalanos-Syntheticae*(?). Glabra; ramuli graciles 2–3 mm. crassi striati, primo rubescentes serius grisei vel ochracei, lenticellis inconspicuis; folia decidua sublanceolato-oblonga acuminata, basi acuta, 15–16 cm. longa 4–5 cm. lata crasse papyracea, supra obscure viridia; utrinque cancellate venosa, nervis ca. 12×2 arcuato-conjunctis, petiolo

5–10 mm. longo gracili; inflorescentia?—A small tree, 3 meters tall, the trunk 5–7 cm. in diameter.

HONDURAS: In ravine near El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6376* (type in herb. Univ. Illinois).

Quercus tenuiaristata Trelease, sp. nov.—*Erythrobalanos-Tristes*(?). Ramulis transiente subvelutinis gracilibus 2–4 mm. crassis striatis subgriseis vix lenticellatis exceptis glabra; gemmae ovoideae glabratae; folia decidua oblongo-lanceolata vel elliptico-lanceolata apice aristata, basi obtusa ad late rotundata, grosse serrata, nervis 12–15 dentibus graciliter setiferis terminatis, petiolo vix 5 mm. longo; inflorescentia?—A small tree, 3 meters tall, the trunk 5–7 cm. in diameter.

HONDURAS: In thicket west of El Achote, above Siguatepeque, Department of Comayagua, 1,400 meters, *Yuncker, Dawson & Youse 6204* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus trichodonta Trelease, sp. nov.—*Erythrobalanos-Acutifoliae*(?). Ramulis novellis pallido-puberulis exceptis glabra; ramuli 3–5 mm. crassi vix striati vel lenticellati; folia decidua lanceolata e medio utrinque angustata, integra, nervis 15 et ultra delicate aristatis, vel supra medium grosse crenata dentibus graciliter aristatis, subtus pallidiora, nervis albis, petiolo crasso vix 5 mm. longo; inflorescentia?—A small tree, 6 meters high, the trunk 5–7 cm. in diameter.

HONDURAS: In ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6116* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus Yousei Trelease, sp. nov.—*Leucobalanos-Corrugatae*(?). Ramuli pallidi glabri graciles; gemmae subglobosae glabratae; stipulae 2 mm. longae deciduae striatae; folia decidua prope nodos dense inserta lanceolata obtuse subacuminata, basi cordulata, petiolo brevissimo, supra medium grosse obtuseque crenato-serrata, 14–15 cm. longa 3.5 cm. lata, nervis ca. 12–15×2; inflorescentia?—A small tree, 4 meters tall, the trunk 5–6 cm. in diameter.

HONDURAS: Ravine at El Achote, above Siguatepeque, Department of Comayagua, 1,350 meters, *Yuncker, Dawson & Youse 6297* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

Quercus Yunckeri Trelease, sp. nov.—*Leucobalanos-Circinatae*(?). Ramuli crassiusculi 4–5 mm. crassi striati ferrugineo-villosi; folia ut videtur ad nodos anni prioris fasciculata late oblanceo-

lata acute acuminata, versus basin integra longicuneata, supra medium subgrosse mucronato-serrata, 22 cm. longa 9 cm. lata, primo subtus laxe tomentosa, nervis 15×2 non arcuato-conjunctis, petiolo fere nullo; fructus?—A small tree, 6 meters tall, the trunk 5–7 cm. in diameter.

HONDURAS: In dense forest near the summit of the range above El Achote, above Siguatepeque, Department of Comayagua, 1,800 meters, *Yuncker, Dawson & Youse 6180* (type in herb. Univ. Illinois; duplicate in Herb. Field Mus.).

ULMACEAE

CHAETOPTELEA Liebm.

Chaetoptelea mexicana Liebm. A tree about 6 meters tall and 15 cm. in diameter. In a marsh near El Achote.

MORACEAE

CECROPIA L.

Cecropia mexicana Hemsl. A tree about 7.5 meters tall and 10–12 cm. in diameter. In a wet ravine near El Achote.

DORSTENIA L.

Dorstenia Contrajerva L. River bank.

FICUS L.

Ficus costaricana (Liebm.) Miq. A tree about 9 meters tall and 1–1.5 meters in diameter. In a wet ravine near El Achote. This tree has not been recorded for Honduras.

Ficus glabrata HBK. A fine, broad-topped tree about 15 meters tall and 60 cm. in diameter. River bank.

Ficus involuta (Liebm.) Miq. A tree about 4–5 meters tall and 30 cm. in diameter. River bank.

Ficus padifolia HBK. A tree about 8 meters tall and 60 cm. in diameter. River bank.

Ficus radula Willd. A tree about 9 meters tall and 60 cm. in diameter. River bank.

Ficus velutina Willd. A tree about 6 meters tall and 10 cm. in diameter. In a wet ravine near El Achote.

MORUS L.

Morus multicaulis Perr. A small plantation of this species was found near Siguatepeque.

TROPHIS L.

Trophis chorizantha Standl. A tree about 7.5 meters tall and 10 cm. in diameter. Near the summit of the range above El Achote. This tree, known formerly only from Honduras, has been collected recently in the region of El General, Costa Rica.

URTICACEAE

BOEHMERIA Jacq.

Boehmeria caudata Sw. Flowers greenish white. River bank about 6 km. west of Siguatepeque.

MYRIOCARPA Benth.

Myriocarpa yzabalensis (D. Sm.) Killip. A tree about 4.5 meters tall. In a wet ravine near El Achote.

LORANTHACEAE

PHORADENDRON Nutt.

Phoradendron commutatum Trel. On a tree near Potrerillos.

Phoradendron piperoides (HBK.) Trel. On a tree near the shore of Lake Yojoa.

Phoradendron yojoanum Trelease, sp. nov.—*Aequitoriales-Annulatae.* Plus minusve pseudodichotoma, cataphyllis omnibus basalibus, subconspicue nodosa, internodiis breviusculis 3–5 cm. longis, infra nodos ancipitibus, alibi in sectione rhombeis vel teretibus; par cataphyllorum 1 basale, cataphyllis annulatis; folia plus minusve falcate oblanceolata obtusa, basi cuneato-contracta vix petiolata, 5–6 cm. longa 1–2 cm. lata, opaca subpapillata basinervia, nervis apicem versus evanescentibus; spicae breves vix 2 cm. longae, articulis ca. 4 clavatis, floribus luteis 4-seriatim insertis, pedunculo brevi; baccae ut dicitur albae.

HONDURAS: Paral, Lake Yojoa, Dept. Cortés, at 630 meters, *T. G. Yuncker 4879* (type in Herb. Univ. Illinois), *4872*.

Phoradendron Yunckeri Trelease, sp. nov.—*Aequitoriales-Heydeanae.* Aliquanto pseudodichotoma glabra, internodiis breviusculis 3–4 cm. longis primo infra nodos ancipiti-dilatatis cito teretibus; par cataphyllorum 1 basale in nodo infimo tantum insertum, cataphyllis patentibus; folia oblonga vel elliptica aliquanto falcata obtusa, basi cuneatim in petiolum 10 mm. longum angustata, firma opaca pinnatinervia, costa percurrente, 5–7 cm. longa 2.5–3 cm. lata; spicae solitariae longiusculae 40–50 mm. longae, articulis ca. 4

gracilibus subfusiformibus, floribus 4+2-seriatim insertis, pedunculo vix 5 mm. longo; fructus juvenilis globosus, sepalis arcte inflexis.

HONDURAS: Near Paral, Dept. Cortés, 630 meters, *T. G. Yuncker 5097* (type in herb. Univ. Illinois).

STRUTHANTHUS Mart.

Struthanthus cassythoides Millsp. On an oak tree near El Achote.

Struthanthus densiflorus (Benth.) Standl. On pine. Hills east of Siguatepeque.

Struthanthus orbicularis (HBK.) Blume. On a tree about 12 km. west of Tela.

POLYGONACEAE

COCCOLOBA L.

Coccoloba cardiophylla Standl. A small tree about 4.5 meters tall and 10 cm. in diameter. On plains. The species has been known previously only from the Yucatan Peninsula, and was scarcely to be expected in central Honduras.

POLYGONUM L.

Polygonum hispidum HBK. Flowers white. In a marsh.

Polygonum punctatum Ell. In a marsh near the shore of Lake Yojoa.

NYCTAGINACEAE

BOERHAAVIA L.

Boerhaavia erecta L. In waste places near Potrerillos.

MIRABILIS L.

Mirabilis Jalapa L. Flowers pink or white. Escaped along bank of river.

PHYTOLACCACEAE

PHYTOLACCA L.

Phytolacca Meziana H. Walt. An herb. Perianth greenish to somewhat pink. Sprawling over shrubs and on the ground in the forest near the summit of the range above El Achote.

Phytolacca rivinoides Kunth & Bouché. Stems 12–14 mm. thick at the base and somewhat woody; racemes up to 60 cm. long; flowers pinkish white; berries purple. Sprawling over shrubs in forest near the summit of the range above El Achote.

CARYOPHYLLACEAE

ARENARIA L.

Arenaria lanuginosa (Michx.) Rohrb. A prostrate herb with white flowers. River bank.

DRYMARIA Willd.

Drymaria villosa Schl. & Cham. A low herb. A very common weed, in waste places.

RANUNCULACEAE

THALICTRUM L.

Thalictrum hondurense Standl., sp. nov.—Herba perennis ca. metralis, caule crassiusculo tereti superne dense glanduloso-puberulo inferne fere glabro, internodiis elongatis; folia magna, petiolo 2–2.5 cm. longo ad vel fere ad apicem late vaginato, vagina nervosa glabra; foliola numerosa paullo supra basin peltata membranacea ambitu rotundata vel obovato-rotundata, interdum ovato-rotundata, plerumque 2–2.5 cm. longa, longipetiolulata, plerumque plus minusve triloba et vulgo grosse paucicrenata, supra sparse glandulosa, subtus ubique glanduloso-scaberula, pallida, venis valde elevatis laxe reticulatis; flores dioeci, feminei laxe paniculati, panicula magna laxa, floribus ad 2.5 cm. longe pedicellatis; achaenia vulgo 2–3 sessilia glanduloso-puberula valde obliqua et curva, immatura fere 5 mm. longa, basi acuta, apice acuta et subito in stylum filiforme usque 6 mm. longum contracta, tenuiter costata.—Honduras: On rocky hillside near Siguatepeque, Dept. Comayagua, July 11, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5796* (type in Herb. Field Mus.).

"Plants more or less viscid and with a pungent odor; roots a rich yellow color." Closely related to *T. guatemalense* C. DC. & Rose, which is noteworthy for the much longer and denser pubescence found on all parts of the plant.

MENISPERMACEAE

CISSAMPELOS L.

Cissampelos Pareira L. A woody vine. Climbing over shrubs in a thicket near Potrerillos.

Cissampelos tropaeolifolia DC. A woody vine. Climbing over shrubs. River bank.

ANNONACEAE

GUATTERIA Ruiz & Pavón

Guatteria grandiflora Donn. Sm. A tree 6–7.5 meters tall and 10–12 cm. in diameter. Perianth yellow-buff tinged with pink. In a wet ravine near the summit of the range above El Achote.

SAPRANTHUS Seem.

Sapranthus microcarpus (D. Sm.) Fries. A shrub about 2 meters tall. Corolla dull, dark red; flowers fragrant. River bank.

MONIMIACEAE

SIPARUNA Aubl.

Siparuna nicaraguensis Hemsl. A small tree about 4.5 meters tall and 3–5 cm. in diameter; fruit dark red, fleshy. Bottom of a ravine near El Achote; also in a thicket near the shore of Lake Yojoa.

LAURACEAE

LITSEA Lam.

Litsea glaucescens HBK. A tree about 2.5–3 meters tall and 3–5 cm. in diameter. In a wet ravine near El Achote. New to the Honduran flora.

NECTANDRA Roland

Nectandra sanguinea Rottb. A shrub 3.5–4.5 meters tall. In a thicket west of El Achote.

Nectandra surinamensis Mez. A tree about 9 meters tall and 15–20 cm. in diameter; corolla white; flowers fragrant. In a ravine about 6 km. west of Siguatepeque.

PHOEBE Nees

Phoebe helicterifolia Mez. A tree about 7 meters tall and 15 cm. in diameter. River bank.

Phoebe mexicana Meissn. A tree about 9 meters tall and 45 cm. in diameter River bank.

CRASSULACEAE

BRYOPHYLLUM Salisb.

Bryophyllum pinnatum (L.) Kurz. An herb about 1 meter tall; flowers reddish. River bank.

HAMAMELIDACEAE

DISTYLIUM Sieb. & Zucc.

Distylium guatemalense Radlk. ex Harms, Notizbl. Bot. Gart. Berlin 11: 716. *f. 13.* 1933.—A tree about 9 meters high and 20–25 cm. in diameter; in wet ravine near El Achote, hills above the plains of Siguatepeque, 1,350 meters, *Yuncker, Dawson & Youse 6377.* This tree is the only American representative of the genus *Distylium,* represented otherwise by about nine species in tropical and subtropical southeastern Asia. Its occurrence in Guatemala (where first collected by Tuerckheim in 1907, near Cobán, at 1,350 meters, *No. II. 1613*) and Honduras is, therefore, a matter of more than passing interest from the standpoint of distribution of the Hamamelidaceae. The Tuerckheim material is in flower, and at that stage the plant at first glance gives little indication of its relationship with this group, at least to one not especially familiar with the family. A specimen of the Tuerckheim number sent me some years ago from the Delessert Herbarium I failed to place, but when Dr. Harms's description and excellent illustration were published in 1933, I immediately recalled the specimen that I had been unable to name.

The Honduras collection is clearly of the same species, and bears fruits, which were not available to Radlkofer and Harms. These in appearance remind one at once of those of witch hazel (*Hamamelis*). They are very hard and woody, blackish and somewhat roughened on the outer surface, which is densely stellate-tomentose, nearly 1.5 cm.; no seeds are present on the evidently old capsules with the specimen. A remarkable character much in evidence in the Honduran material but not mentioned in the original description is the fact that some but not all the leaves are conspicuously peltate at the base, the blade being extended for about 2 mm. below the insertion of the petiole. Paul C. Standley.

LIQUIDAMBAR L.

Liquidambar Styraciflua L. A tree about 6 meters tall and 15–20 cm. in diameter (some specimens seen were much larger). Near El Achote.

ROSACEAE

PHOTINIA Lindl.

Photinia microcarpa Standl. A tree about 4.5 meters tall and 8–10 cm. in diameter; fruit red. In a wet ravine near El Achote. The tree occurs also in the mountains of British Honduras.

RUBUS L.

Rubus adenotrichos Schlecht. A shrub about 2 meters tall. Edge of a ravine near El Achote.

Rubus miser Liebm. A shrub about 2.5 meters tall; flowers pink or white. In a thicket near margin of forest at the summit of the range above El Achote.

CONNARACEAE

CONNARUS L.

Connarus Lambertii (DC.) Britton. A shrub about 2.5 meters tall; pods red. In a marsh west of Tela.

KRAMERIACEAE

Krameria cuspidata Presl. A shrub about 1 meter high; flowers light maroon. On a rocky hillside.

LEGUMINOSAE

ACACIA Willd.

Acacia Farnesiana (L.) Willd. A small tree about 3 meters tall; flowers yellow. Alluvial soil, river bottoms.

Acacia Milleriana Standl. A tree 5–6 meters tall and 30 cm. in diameter. Frequent on the plains.

Acacia salvadorensis (Britt. & Rose) Standl. A shrub about 1.5 meters tall; corolla greenish, becoming reddish toward the base; stamens pure white. In an open ravine, under pines, near El Achote.

CALLIANDRA Benth.

Calliandra arborea Standl., sp. nov.—Pl. XII. Arbor 4–9-metralis, trunco 5–15 cm. diam., ramulis ochraceis subteretibus solemniter elevato-lenticellatis glabris dense foliatis; stipulae parvae striatae; folia glabra 1–2 cm. longe petiolata, pinnis unijugis, foliolis 6; foliola sessilia coriacea valde obliqua, semiovata, paris terminalis 4–11 cm. longa 1.5–4 cm. lata, apicem versus longe anguste acuminata, apice ipso obtuso, basi valde obliqua semiobtusa, lucida, supra griseo-viridia, nervis prominulis, venulis manifestis vix prominulis, subtus fere concoloria, basi triplinervia, nervis 2 centralibus fere ad apicem prolongatis gracilibus prominentibus, venis prominulis laxe reticulatis; capitula axillaria solitaria dense multiflora staminibus exclusis fere 1.5 cm. diam., pedunculis 1.5–2 cm. longis glabris vel sparse villosulis; calyx tubuloso-campanulatus 1.5–2.5 mm. longus sparse minute puberulus, dentibus brevissimis obtusis; corolla 1 cm. longa angusta glabra vel sparse minutissime puberula, lobis acutis ca. 2 mm. longis; stamina 3–3.5 cm. longa.—Honduras: In thicket near El Rincón, about 10 miles west of Siguatepeque, Dept. Comayagua, 1,400–1,500 meters, July 24, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6047* (type in Herb. Field Mus.); corolla reddish, the filaments red on the outermost half. Side of ravine near El Achote, hills above the plains of Siguatepeque, 1,350 meters, *Yuncker, Dawson & Youse 5912;* round-topped. Open mountain forest, Jacaieto, Dept. Comayagua, 600 meters, August, 1933, *J. B. Edwards 637;* flowers red and white.

Calliandra arborea is noteworthy for the large size of the plant, herbs and shrubs being much more common in the genus than trees, even small ones. It is most closely related to *C. centralis* (Britt. & Rose) Standl., also Honduran, which has smaller, very obtuse leaflets and usually a noticeable amount of pubescence on various parts of the plant. *C. centralis* (*Anneslia centralis* Britt. & Rose, N. Amer. Fl. 23: 52. 1928) is based upon *C. Thieme 5214* from Santa Bárbara, Honduras, a sheet of which is in the Herbarium of Field Museum. The original description of this species is so badly and incorrectly drawn that I suspected the type must be different from the Field Museum specimen. The type was kindly lent from the U. S. National Museum, and was found to agree exactly with the specimen in Field Museum. It is probable, therefore, that all specimens of this number in other herbaria are conspecific, although upon comparing them with Britton and Rose's description, one would be convinced that they represented a distinct species.

Calliandra centralis (Britt. & Rose) Standl. A small tree, about 4.5 meters tall. Stamens scarlet. Growing on a river bank.

Calliandra leucothrix Standl., sp. nov.—Frutex 1.5 m. altus, ramis crassiusculis teretibus fusco-brunneis dense pilis brevibus albidis patentibus hirsutis, sat dense foliatis; stipulae deciduae 4 mm. longae hispidulae; folia mediocria breviter petiolata ad 16 cm. longa, pinnis ca. 13-jugis; foliola parva ca. 25-juga crasse membranacea anguste oblonga 4–6 mm. longa 1.5 mm. lata obtusa vel acutiuscula, basi valde obliqua, 1-nervia, glabra sed ad margines dense pilis longis albis adpressis ciliata, nervis lateralibus subtus prominulis manifestis; capitula pauciflora breviter pedunculata racemum brevem terminalem efformantia, pedunculis ad 1 cm. longis subadpresso-hispidulis, bracteis ad basin capituli insertis parvis vix 2 mm. longis,

floribus crasse fere 2 mm. longe pedicellatis; calyx ca. 2 mm. longus atque 4 mm. latus remote triangulari-dentatus, extus pilis albidis adpresso-hispidulus; corolla 1 cm. longa extus dense albo-strigosa, lobis tubo aequilongis oblongo-lanceolatis acuminatis erectis; filamenta purpurea ca. 6 cm. longa.—Honduras: In pine forest near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 26, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6128* (type in Herb. Field Mus.).

Belonging to the group *Houstonianae* of the genus *Anneslia*, as treated by Britton and Rose in the *North American Flora*, and apparently closest to their *Anneslia pueblana*.

Calliandra Yunckeri Standl., sp. nov.—Frutex 2-metralis, ramis crassis teretibus ochraceis densiuscule lenticellatis, foliis inflorescentiisque e ramis abbreviatis crassis nascentibus; stipulae persistentes imbricatae; folia parva, petiolo 6–12 mm. longo sparse longipiloso, rhachi gracili ad 1.5 cm. longa sparse pilosa; pinnae 2–3-jugae 1.5–3.5 cm. longae, rhachi sparse pilosa, foliolis 9–16-jugis oblongis plerumque 6–7 mm. longis atque 2.5–3 mm. latis acutiusculis vel obtusis, basi valde obliquis, glabris sed dense pilis longis albis ciliatis, subtus paullo pallidioribis costa excentrica prominente, nervis lateralibus paucis prominulis irregularibus; capitula axillaria pauca ca. 2.5 cm. longe pedunculata dense subpauciflora; calyx tubuloso-campanulatus fere 3 mm. longus dentibus brevissimis pilosulis exceptis glaber; corolla 6 mm. longa lobis brevibus late ovato-triangularibus sparse minute puberulis exceptis glabra; stamina ca. 3 cm. longa.—Honduras: In thicket, plain near Siguatepeque, Dept. Comayagua, 1,050 meters, July 4, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5622* (type in Herb. Field Mus.).

CALOPOGONIUM Desv.

Calopogonium coeruleum Benth. A woody vine; flowers purple. River bank.

CANAVALIA HBK.

Canavalia villosa Benth. A herbaceous vine with showy, blue-lavender flowers. Thicket near El Achote.

CASSIA L.

Cassia laevigata Willd. A shrub about 2 meters tall; flowers yellow. Ravine near El Achote.

Cassia serpens L. A low, prostrate herb with yellow flowers. In wet, rocky soil in pine forest.

Cassia spectabilis DC. A spreading, round-headed tree about 7–8 meters tall; flowers yellow. River bank.

COLOGANIA Kunth

Cologania procumbens Humb. & Bonpl. Flowers blue. In wet soil, pine forest.

DALBERGIA L. f.

Dalbergia cubilquitzensis (D. Sm.) Pittier. A tree about 6 meters tall. In forest near the summit of the range above El Achote.

DESMODIUM Desv.

Desmodium axillare (Sw.) DC. Corolla red; a weed, in open places about Lancetilla valley.

Desmodium cajanifolium (HBK.) DC. Flowers lavender. River bank.

Desmodium frutescens (Aubl.) Schindl. Plants 30–60 cm. tall, becoming woody below; flowers lavender. In wet soil, pine forest.

Desmodium luteolum Standl., sp. nov.—Pl. XIII. Herba ut videtur erecta 60 cm. alta vel ultra, caule crasso tereti striato pallide viridi densissime pilis longis patentibus laxis albidis vel fulvis piloso, internodiis brevibus; stipulae longius persistentes ca. 12 mm. longae e basi late subcordato-ovata abrupte anguste caudatae brunneae striatae densissime pilosae; folia modica longipetiolata, petiolo gracili 6–7.5 cm. longo dense patenti-piloso, rhachi ca. 1.5 cm. longa, stipellis lineari-filiformibus ca. 5 mm. longis attenuatis, petiolulis crassis ca. 3 mm. longis dense pilosis; foliola 3 deltoideo-rotundata, ovato-rotundata vel fere orbicularia 4.5–6 cm. longa 4–5.5 cm. lata, apice late rotundata, basi subtruncata vel late rotundata et emarginata, crasse membranacea, supra in sicco luteo-viridia dense pilis laxis subadpressis albidis longipilosa et papillosa, subtus paullo pallidiora ubique similiter sed densius pilosa, nervis venisque prominentibus teneris, venis subarcte reticulatis; racemi simplices longipedunulati subdense multiflori ca. 30 cm. longi densissime viscido-pilosi, bracteis caducis, pedicellis gracilibus inaequalibus usque 18 mm. longis adscendentibus dense viscido-pilosis; calyx ca. 8 mm. longus sparse longipilosus profunde lobatus, lobis lanceolatis longe subulato-attenuatis; corolla ca. 11 mm. longa, petalis glabris; legumen non visum.—Honduras: On rocky hillsides above Siguatepeque, Dept. Comayagua, 1,200 meters, July 11, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5793* (type in Herb. Field Mus.).

"Flowers greenish yellow."

DIALIUM L.

Dialium guianense (Aubl.) Steud. A tree 7.5 meters tall. In wet soil at Puerto Arturo, 12 km. west of Tela.

ERIOSEMA Desv.

Eriosema diffusum (HBK.) Don. Flowers pinkish yellow. On a rocky hillside in pine forest.

ERYTHRINA L.

Erythrina rubrinervia HBK. A tree 6–8 meters tall; flowers scarlet. Rather frequent along river banks.

GLIRICIDIA HBK.

Gliricidia meistophylla (Donn. Sm.) Pittier. A small tree about 2 meters tall. Ravine near El Achote. The species is new to the flora of Honduras.

INDIGOFERA L.

Indigofera suffruticosa Mill. A shrub about 3 meters tall; flowers pinkish. In wet soil, waste places on plains.

INGA Scop.

Inga cobanensis Pittier. A tree about 10 meters tall; pods brown, woolly. In a wet ravine near El Achote.

MIMOSA L.

Mimosa albida Humb. & Bonpl. A shrub about 1.5 meters tall; corolla pinkish brown; stamens white or pink. In a ravine in pine forest near El Achote.

Mimosa pigra L. A shrub about 2.5 meters tall. In a marsh.

Mimosa pudica L. Flowers pink. Abundant in old meadows and waste areas.

PARKINSONIA L.

Parkinsonia aculeata L. A tree about 6 meters tall. Planted near Siguatepeque.

PAROSELA Cav.

Parosela sericea (Lag.) Rose. In open pine forest above El Achote.

PHASEOLUS L.

Phaseolus anisotrichus Scheele. Flowers orange. Rocky hillside.

PISCIDIA L.

Piscidia grandifolia (Donn. Sm.) I. M. Johnston. A tree about 6 meters tall. Rather frequent along river banks.

PITHECOLOBIUM Mart.

Pithecolobium arboreum (L.) Urban. A small tree about 3.5 meters tall. In forest near the summit of the range above El Achote.

RHYNCHOSIA Lour.

Rhynchosia pinetorum Standl., sp. nov.—Herbacea scandens, caule gracillimo subtereti pilis patentibus viscidis lutescentibus piloso, internodiis plerumque foliis longioribus; stipulae persistentes lineari-oblongae acutae costatae ca. 4 mm. longae breviter pilosae; folia parva 6–13 mm. longe petiolata, petiolo gracili viscido-piloso, rhachi ad 6 mm. longa; foliola 3 triangularia vel ovato-deltoidea 1.5–2.5 cm. longa 1–1.5 cm. lata sensim attenuato-acuminata, basi late rotundata, crasse membranacea, supra in sicco viridia papillosa et dense molliter pilosa, subtus fere concoloria, minute glanduloso-punctata, dense molliter pilosa, nervis conspicuis elevatis; racemi axillares laxe 3–6-flori ad 3.5 cm. longe pedunculati, rhachi dense viscido-pilosa, bracteis brunnescentibus tenuibus caducis ovato-oblongis, floribus remotis, pedicellis ca. 2 mm. longis; calyx viscido-pilosus 5–6 mm. longus, tubo late campanulato basi obtuso vel rotundato, lobis tubo paullo longioribus, lobo infimo aliis longiore, omnibus lineari-lanceolatis longiattenuatis enerviis; corolla 8 mm. longa, vexillo extus apicem versus breviter piloso; legumen immaturum oblongum 17 mm. longum 5 mm. latum sessile dense pilis longis et brevibus intermixtis plus minusve viscidis pilosum, apice obtusum vel subrotundatum et subito in stylum ad 9 mm. longum contractum; semina 2.—Honduras: On rocky hillside above Siguatepeque, Dept. Comayagua, 1,200 meters, July 11, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5791* (type in Herb. Field Mus.).

VIGNA Savi

Vigna repens (L.) Kuntze. A trailing vine with yellow flowers. Subalpine bog near El Achote.

ZORNIA Gmel.

Zornia diphylla (L.) Pers. A low, prostrate herb with yellowish flowers. In wet areas.

OXALIDACEAE

OXALIS L.

Oxalis latifolia HBK. Flowers lavender or violet. Common in the pine forest belt above the plains.

Oxalis Neaei DC. Flowers yellow. River bank.

RUTACEAE

ZANTHOXYLUM L.

Zanthoxylum limoniodorum Standl., sp. nov.—Frutex ut dicitur scandens, fere omnino ut videtur glaber, ramulis crassis teretibus fuscescentibus atque rimosis, internodiis plus minusve elongatis, sparse aculeis recurvis basi latis vix 4 mm. longis armatis; folia breviter petiolata ca. 13 cm. longa, rhachi supra canaliculata exalata ut petiolo aculeis numerosis recurvis brunneis ca. 3 mm. longis armata; foliola ca. 19 sessilia vel brevissime petiolulata oblongo-ovalia vel terminale ovato-ovale, 2–3.5 cm. longa 1–1.6 cm. lata, apice obtusa vel rotundata et breviter retusa, basi obtusa vel rotundata, coriacea, fere ad basin grosse glanduloso-crenata, supra in sicco olivacea sublucida, costa impressa, nervis obsoletis, subtus lutescentia vel brunnescentia, costa gracili elevata interdum prope basin aculeolata, nervis lateralibus obscuris; inflorescentia ut videtur axillaris pyramidali-paniculata folio brevior multiflora, ramis puberulis, floribus breviter crasse pedicellatis; folliculus ut videtur 1 tantum globosus sessilis basi et apice rotundatus ca. 5 mm. diam.—Honduras: Climbing in trees in a ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 19, 1936, *T.G. Yuncker, R.F. Dawson & H. R. Youse 5974* (type in Herb. Field Mus.).

"Fruit with a strong lemon odor." Noteworthy for the small, blunt, coriaceous, coarsely crenate leaflets, and for the abundant prickles of the leaves. The material is in such advanced fruiting condition that the flower details can not be determined.

Zanthoxylum microcarpum Griseb. A small tree, about 4.5 meters tall and 8–10 cm. in diameter, flowers greenish white. River bank.

SIMARUBACEAE

PICRAMNIA Sw.

Picramnia andicola Tulasne. A tree about 4.5 meters tall and 5–8 cm. in diameter. In a wet ravine near El Achote. A species new for Honduras.

Picramnia locuples Standl., sp. nov.—Frutex vel arbuscula 2–4.5 m. alta, trunco ad 5 cm. diam., ramulis gracilibus teretibus brunnescentibus dense pilis brevibus sordidis patentibus vel adscendentibus pilosis, internodiis plerumque elongatis; folia breviter petiolata 7–16 cm. longa, rhachi gracili dense pilosula; foliola ca. 19 parva membranacea oblique ovata ad lanceolato-oblonga 1.5–3.5 cm. longa 8–12 mm. lata obtusa ad acuminata, apice ipso obtuso, basi oblique rotundata vel obtusa, supra in sicco fusco-viridia ad costam pilosula aliter glabra, nervis obsoletis, subtus paullo pallidiora tantum ad costam gracilem prominentem incurvo-pilosula, ciliata, nervis prominulis paucis; inflorescentia feminea racemosa simplex graciliter longipedunculata, racemis laxe multifloris ad 8 cm. longis, rhachi dense breviter pilosa, pedicellis patentibus plerumque 8–10 mm. longis glabris; sepala decidua; fructus immaturus obovoideus glaber apice rotundatus 4 mm. longus.—Honduras: In forest near the summit of the ridge above El Achote, above the plains of Siguatepeque, Dept. Comayagua, 1,800 meters, July 21, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6006* (type in Herb. Field Mus.). In wet ravine near El Rincón, about 10 miles west of Siguatepeque, 1,400 meters, *Yuncker, Dawson & Youse 6063.*

Fruit bright red. Well marked among Central American species of *Picramnia* by the small and usually numerous leaflets.

MELIACEAE

MELIA L.

Melia Azedarach L. A small tree about 3 meters tall and 7–8 cm. in diameter. Naturalized on a river bank.

TRICHILIA L.

Trichilia havanensis Jacq. A tree 7–8 meters tall and 45 cm. in diameter. Frequent. River bank.

MALPIGHIACEAE

BUNCHOSIA Rich.

Bunchosia pilosa HBK. A shrub about 2 meters tall; corolla yellow. Bottom of a wet ravine near El Rincón; also near El Achote.

BYRSONIMA Rich.

Byrsonima crassifolia (L.) DC. A small tree about 3 meters tall and 7-8 cm. in diameter; flowers orange. On a rocky hillside in pine forest belt; also on sand dunes near the beach west of Tela.

MALPIGHIA L.

Malpighia glabra L. A tree 7.5-9 meters tall and 10-12 cm. in diameter; petals pink. In wet ravine near El Achote.

STIGMAPHYLLON Juss.

Stigmaphyllon ellipticum (HBK.) Juss. A woody vine, climbing over shrubs in a thicket. River bank.

Stigmaphyllon puberum Juss. A woody vine; corolla yellow and orange. Climbing in a thicket between Tela and Lancetilla Valley.

POLYGALACEAE

POLYGALA L.

Polygala glochidiata HBK. Flowers white. River bank.

Polygala incarnata L. Corolla purplish. In pine forest.

Polygala longicaulis HBK. Flowers pink. In an old, wet pasture.

DICHAPETALACEAE

DICHAPETALUM Thouars

Dichapetalum Donnell-Smithii Engler. A shrub or small tree 4.5 meters tall. In a thicket near the beach west of Tela.

EUPHORBIACEAE

ACALYPHA L.

Acalypha alopecuroides Jacq. A weedy plant in waste places.

Acalypha leptopoda Muell. Arg. A small, slender tree about 3-4 meters tall. Thicket. River bank.

Acalypha macrostachya Jacq. A tree about 3.5 meters tall and 2.5-5 cm. in diameter. On a ridge about 6 km. north of Siguatepeque.

Acalypha porphyrantha Standl. A shrub 0.5-1 meter tall. River bank.

CROTON L.

Croton ciliato-glandulosus Ortega. A shrub about 1 meter tall; flowers white. River bank.

Croton repens Schlecht. A shrub about 50–60 cm. tall or less; flowers white. Frequent in thickets.

EUPHORBIA L.

Euphorbia graminea Jacq. A weedy herb. River bank.

JATROPHA L.

Jatropha Curcas L. A small tree about 3 meters tall and 15 cm. in diameter. River bank.

ANACARDIACEAE

RHUS L.

Rhus terebinthifolia Schl. & Cham. A tree about 3.5 meters tall and 5 cm. in diameter. In a wet ravine near El Achote.

AQUIFOLIACEAE

ILEX L.

Ilex hondurensis Standl., sp. nov.—Pl. XIV. Arbor 4.5–7.5 m. alta, trunco 7.5–20 cm. diam., omnino glabra, ramulis subteretibus fuscescentibus lenticellatis rimosis, novellis subangulatis fuscis, internodiis brevibus; folia modica breviter petiolata rigide coriacea, petiolo crasso 2–4 mm. longo; lamina elliptica, ovalis vel rotundato-ovalis 5–6.5 cm. longa 3–4.5 cm. lata, apice late rotundata vel obtusa, basi rotundata vel obtusa, ubique supra basin remote obscure adpresso-crenata, interdum fere integra, supra in sicco sublucida, costa prominente, nervis obscuris non elevatis, subtus fere concolor, costa crassiuscula prominula, nervis lateralibus utroque latere ca. 6 angulo lato adscendentibus fere rectis vix prominulis remote a margine irregulariter arcuato-junctis, venulis fere obsoletis; flores feminei axillares fasciculati pauci (ca. 3 in axilla), pedicellis gracilibus ca. 4 mm. longis; calyx subadpressus 2 mm. latus brevissime obscure 5-lobus; fructus immaturus globosus 2.5 mm. longus stigmate magno terminatus.—Honduras: Edge of ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, August 3, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6293* (type in Herb. Field Mus.). In forest near the summit of the ridge above El Achote, 1,800 meters, July 28, 1936, *Yuncker, Dawson & Youse 6179.* Near El Achote, 1,350 meters, *Yuncker, Dawson & Youse 5838.*

Related to the Mexican *I. tolucana* Hemsl., in which the leaves are acute at the base and merely obtuse at the apex.

CELASTRACEAE

RHACOMA L.

Rhacoma eucymosa (Loes. & Pitt.) Standl. A shrub. In dense forest, hills above Lancetilla Valley.

STAPHYLEACEAE

TURPINIA Vent.

Turpinia paniculata Vent. A tree about 7.5 meters tall and 10–12 cm. in diameter. Ravine near El Achote.

SAPINDACEAE

CARDIOSPERMUM L.

Cardiospermum microcarpum HBK. A vine climbing in a thicket. River bank.

VITACEAE

CISSUS L.

Cissus cacuminis Standl., sp. nov.—Frutex scandens, ramis crassis subteretibus ferrugineis lenticellis magnis elevatis notatis glabris vel sparse pilosis rimosis, cortice cito exfoliante, internodiis plus minusve elongatis; folia mediocria longipetiolata in sicco membranacea et fragilia, simplicia, petiolo gracili 1.3–4.5 cm. longo sparse pilis longis laxis albidis piloso vel glabrato; lamina ovata vel late ovata 4–9.5 cm. longa 3–5 cm. lata sensim acuminata, basi truncata vel saepius breviter late cordata, ubique remote vel dense serrata, serraturis angustis subulato-apiculatis adpressis, supra in sicco viridis primo sparse villosa cito glabrata, costa nervisque prominentibus, subtus concolor primo sat dense pilis longis pallidis vel brunnescentibus laxis villosa cito glabrata, basi 5-nervia, costa gracili prominente supra basin nervos laterales ca. 3 emittente, venulis obviis sed non elevatis; cymae oppositifoliae graciliter pedunculatae laxe multiflorae ca. 3 cm. latae et aequilongae, ramis sat dense villosis, floribus lutescentibus parvis umbellatis, pedicellis gracilibus 2–4 mm. longis adpresso-pilosis; calyx patelliformis vix ultra 1 mm. latus undulatus; petala paullo ultra 1 mm. longa.—Honduras: Climbing in trees in wet ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, August 5, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6330* (type in Herb. Field

Mus.). In forest near the summit of the range above El Achote, in cloud zone, 1,800 meters, *Yuncker, Dawson & Youse 6005.*

Although doubtless related to the common *C. sicyoides* L., the present plant is obviously different in general appearance as well as in some of the minor details, and I have no doubt that it represents a well marked species.

Cissus Martiniana Woodson & Seibert. Climbing over shrubs in forest near the summit of the range above El Achote. A recently described species, the type from Panama, occurring also in Costa Rica.

Cissus rhombifolia Vahl. Scrambling over shrubs in a wet ravine near El Rincón.

Cissus salutaris HBK. Climbing in a thicket on a rocky hillside.

VITIS L.

Vitis tiliifolia Humb. & Bonpl. A woody vine climbing over shrubs in a wet ravine near El Achote.

MALVACEAE

MALVAVISCUS Cav.

Malvaviscus arboreus Cav. A shrub about 3.5 meters tall; corolla scarlet. In a wet ravine near the summit of the range above El Achote.

SIDA L.

Sida ciliaris L. A low shrub; flowers salmon. On plains.

Sida linifolia Juss. A low, half-woody shrub. In a thicket.

ACTINIDIACEAE

SAURAUIA Willd.

Saurauia leucocarpa Schlecht. A small tree about 4.5 meters tall and 5 cm. in diameter; fruit succulent, with scattered, small, brown seeds in a viscid pulp. In forest near the summit of the range above El Achote. An addition to the known trees of Honduras.

Saurauia villosa DC. A tree 6–7 meters tall and 15 cm. in diameter; flowers white, fragrant. In forest near the summit of the range above El Achote.

OCHNACEAE

SAUVAGESIA L.

Sauvagesia tenella Lam. An herb; flowers pink, delicate. In a wet pasture.

MARCGRAVIACEAE

MARCGRAVIA L.

Marcgravia rectiflora Triana & Planch.? Climbing on a tree on stream bank, bottom of a ravine near El Achote.

SOUROUBEA Aubl.

Souroubea guianensis Aubl. A woody vine; flowers and pedicels orange or reddish. In a ravine near El Achote; also on a tree near the shore of Lake Yojoa.

THEACEAE

EURYA Thunb.

Eurya guatemalensis Donn. Sm. A small tree about 4.5 meters tall and 8 cm. in diameter; flowers white, fleshy. In forest near the summit of the range above El Achote. The species is new to the Honduran flora.

TERNSTROEMIA L. f.

Ternstroemia Tepezapote Cham. & Schl. A tree 6–7 meters tall and 15–20 cm. in diameter; leaves leathery, dark green, shiny. River bank.

GUTTIFERAE

CLUSIA L.

Clusia Salvinii Donn. Sm. A tree 7–8 meters tall and 30 cm. in diameter. The fruit opens in a characteristically stellate form. In a wet ravine near El Achote.

HYPERICUM L.

Hypericum uliginosum HBK. Flowers orange-yellow. In a subalpine bog near El Achote.

VISMIA Vand.

Vismia guianensis (Aubl.) Pers. A tree about 9 meters tall and 15 cm. in diameter. In pine-oak association, El Achote. Not recorded previously for Honduras.

VIOLACEAE

HYBANTHUS Jacq.

Hybanthus oppositifolius (L.) Taub. An herb with somewhat purplish flowers. River bank.

FLACOURTIACEAE

OLMEDIELLA Baill.

Olmediella Betschleriana (Goepp.) Loes. A shrub or small tree about 3.5 meters tall. In thicket near El Achote. For notes regarding this interesting plant see Trop. Woods 32: 17. 1932.

XYLOSMA Forst.

Xylosma Hemsleyana Standl. A shrub about 1 meter tall. In a dry ravine east of Siguatepeque.

PASSIFLORACEAE

PASSIFLORA L.

Passiflora ciliata Dryander. Climbing over shrubs in a thicket, edge of forest, Lancetilla Valley.

Passiflora foetida L. var. **gossypiifolia** (Desv.) Mast. Climbing in a thicket, river bank.

BEGONIACEAE

BEGONIA L.

Begonia tovarensis Klotzsch. Petals pale pink; stems light red. Subalpine bog near El Achote; also in forest, Lake Yojoa.

Begonia Yunckeri Standl., sp. nov.—Pl. XV. Herba ut videtur erecta caulescens ramosa gracilis, ramis sparse pilis longis laxis villosis vel fere glabris, internodiis elongatis; stipulae hyalinae caducae ad 1.5 cm. longae albidae nervosae apice obtusae vel rotundatae glabrae; folia modica longissime petiolata in sicco membranacea, petiolo gracillimo 2.5–8.5 cm. longo sparse laxe villoso vel fere glabro; lamina ambitu oblongo-ovata vel lanceolato-oblonga 6–13 cm. longa 2–5.5 cm. lata, petiolo lateraliter inserto, longissime anguste attenuato-acuminata, basi insigniter obliqua, altero latere semiobtusa, lobo postico late rotundato vel angulato, plus minusve breviter lobata, in toto margine inaequaliter dentata, dentibus breviter vel longe mucronatis et interdum villoso-ciliatis, supra in sicco viridis sublucida sparse pilis brevibus patentibus pallidis villosa vel glabrata, subtus ad nervos dense villosa, aliter glabra, basi vulgo

7-nervia; flores monoeci in umbellas axillares 3–4-floras longe graciliter pedunculatas dispositi, pedicellis gracillimis ad 8 mm. vel in statu fructifero ad 15 mm. longis sparse breviter villosulis vel glanduloso-pilosulis; sepala exteriora floris masculi ovato-rotundata 6 mm. longa et fere aequilata alba glabra apice rotundata basi subcordata; capsula (perfecta non visa) 6 mm. longa atque 4 mm. lata basi obtusa, angulis angustissime alatis, alis vix 1 mm. longis vel obsoletis.—Honduras: On forest floor, forest near the summit of the range above El Achote, in cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,800 meters, July 28, 1936, *T.G. Yuncker, R.F. Dawson & H. R. Youse 6148* (type in Herb. Field Mus.).

"Corolla white. Stems up to 1 cm. in diameter."

CACTACEAE

CEREUS L.

Cereus hondurensis Schum. Forming large patches on rocks near the shore about 8 km. east of Tela.

EPIPHYLLUM Haw.

Epiphyllum caudatum (Vaupel) Britt. & Rose. On a tree at edge of clearing in Lancetilla Valley.

Epiphyllum strictum (Lem.) Britt. & Rose? On a tree near shore of Lake Yojoa; flowers white, 5–8 cm. long. Also on fallen log in a deep, moist ravine near El Rincón.

RHIPSALIS Gaertn.

Rhipsalis Cassutha Gaertn. Forming large clumps on a tree near the shore of Lake Yojoa. Corolla white, fruit pinkish.

LYTHRACEAE

CUPHEA Adans.

Cuphea carthagenensis (Jacq.) Macbr. An herb; flowers magenta. In a wet meadow.

Cuphea Hookeriana Walp. A low shrub less than 1 meter tall; flowers white to purple, attractive. In a ravine near El Achote.

Cuphea utriculosa Koehne. A low, sprawling shrub about 30–50 cm. tall; flowers violet. Frequent in mud along river bank.

MYRTACEAE

CALYPTRANTHES Sw.

Calyptranthes hondurensis Standl. A small tree or shrub up

to 3–4 meters tall. In a thicket near El Achote. The species is known only from this region.

EUGENIA L.

Eugenia apodantha Standl., sp. nov.—Arbuscula 4.5 m. alta, trunco 7 cm. diam., ut videtur dense ramosa, ramulis crassiusculis teretibus ochraceis rimosis, cortice exfoliante, novellis angulatis brunnescentibus dense pilosis, internodiis brevibus; folia modica fere sessilia coriacea, petiolo crasso ca. 2 mm. longo piloso; lamina oblonga vel elliptico-oblonga 7–9 cm. longa 3–3.5 cm. lata acuta, apice ipso obtuso, basi anguste rotundata vel obtusa, supra in sicco griseoviridis dense minute puncticulata, sparse vel subdense pilis longiusculis laxis pilosa vel glabrata, costa impressa, nervis obsoletis, subtus paullo pallidior densiuscule pilis lutescentibus sublucidis pilosa, costa gracillima prominente, nervis lateralibus utroque latere ca. 10 tenerrimis obscuris vix prominulis fere rectis angulo latiusculo divergentibus prope marginem in nervum collectivum fere regularem conjunctis, venis obsoletis; flores axillares solitarii sessiles; fructus immaturus semiglobosus ca. 4 mm. longus et 5 mm. latus basi rotundatus densissime pilis brevibus patentibus ochraceis pilosus; sepala persistentia 4 oblongo-ovata obtusa 4–5 mm. longa patentia utrinque dense breviter pilosa; stylus gracilis glaber 8 mm. longus.—River bank, plain near Siguatepeque, Dept. Comayagua, 1,050 meters, July 9, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5766* (type in Herb. Field Mus.). Also referable here is a sterile specimen: Thicket along river bank near Siguatepeque, a tree of 4.5 meters, February, 1928, *Standley 56057*. It is not improbable that both collections are from the same individual.

The crushed leaves are said to be aromatic. Because of its solitary, quite sessile flowers this can scarcely be confused with any other species of *Eugenia* found in Central America.

Eugenia axillaris (Sw.) DC. A tree 3.5–4.5 meters tall and 10 cm. in diameter; flowers white. River bank.

Eugenia Doubledayi Standl. A small tree about 6 meters tall and 8–10 cm. in diameter; flowers white. River bank. The species is known only from the region of Siguatepeque.

Eugenia vincentina Krug & Urban. A small tree 4–5 meters tall and 15 cm. in diameter. River bank.

Eugenia Yunckeri Standl., sp. nov.—Frutex 2.5 m. altus, ramulis gracilibus teretibus brunnescentibus vel fuscis, novellis ferrugineis densissime velutine patenti-pilosis, internodiis brevibus vel elongatis; folia modica elliptico-oblonga vel elliptica 7–14 cm. longa 3–7 cm. lata sensim vel subabrupte acuminata vel acuta, apice ipso obtuso, interdum apice fere obtusa et tantum obtuse apicata, basi acutisuscula vel obtusa, plus minusve lucida, sparse molliter pilosa, serius glabrata, nervis venisque non elevatis, subtus paullo pallidior, ubique sat dense pilis patentibus pallidis velutino-pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 9 angulo latiusculo adscendentibus rectis vel paullo arcuatis remote a margine irregulariter arcuato-conjunctis, venis vix obviis, ubique dense subgrosse punctata, margine interdum anguste incurvo; flores in axillis fasciculati pauci fere sessiles, pedicellis vix ad 2 mm. longis crassis pilosis; hypanthium hemisphaericum ca. 3 mm. latum dense molliter pilosum; sepala 4 rotundata 2.5–3 mm. longa apice late rotundata ciliata, extus breviter patenti-pilosa, intus dense breviter sericea.—Honduras: In thicket near trail west of El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,300 meters, July 28, 1936, *T.G. Yuncker, R.F. Dawson & H. R. Youse 6178* (type in Herb. Field Mus.). Also (sterile material), El Achote, open mountain forest, a tree 12 meters high, October, 1932, *J. B. Edwards 499.*

Similar to *E. Banghamii* Standl., a frequent species of the Panama Canal Zone.

PSIDIUM L.

Psidium Guajava L. A shrub about 3 meters tall; flowers white. On a rocky hillside.

Psidium molle Bertol. A shrub 2–3 meters tall; flowers white. River bank.

Psidium Oerstedeanum Berg. A low shrub with white flowers. On a rocky hillside.

MELASTOMACEAE

ARTHROSTEMMA Ruiz & Pavón

Arthrostemma fragile Lindl. Corolla pink. Side of a ravine near El Achote.

BLAKEA L.

Blakea aeruginosa Standl., sp. nov.—Arbor 7.5–9 m. alta, trunco 12–15 cm. diam., ramulis crassis obtuse angulatis densissime pilis rufis setoso-pilosis vel fere tomentosis, internodiis valde abbreviatis; folia majuscula longipetiolata coriacea, petiolo crassiusculo usque 4.5 cm. longo supra anguste canaliculato densissime ferrugineo-setuloso; lamina elliptico-oblonga 11–16 cm. longa 5–8 cm. lata abrupte breviter caudato-acuminata, acumine obtuso vix ultra 8 mm. longo, basi anguste rotundata, fere integra, supra in sicco griseo-viridis glabra lucida, nervis solemniter impressis, subtus primo sat dense breviter ferrugineo-setulosa vel serius glabrata, triplinervia vel quintuplinervia (nervis exterioribus multo tenerioribus et marginibus saepe recurvis fere occultis), nervis 3 mediis crassis elevatis apice junctis, nervis lateralibus numerosis approximatis rectis angulo paullo minore quam recto divergentibus prominulis; flores axillares solitarii, pedunculo crasso dense ferrugineo-setuloso 1.5–2 cm. longo; bracteae 4 fere distinctae lanceolatae vel anguste lanceolatae, exteriores ca. 2 cm. longae longissime attenuatae, extus densissime pilis ferrugineis hispidulis setulosae, intus fere glabrae sed apicem versus stellato-puberulae; calycis tubus hemisphaericus ca. 8 mm. longus et aequilatus fere glaber, limbo (lobis inclusis) usque 14 mm. longo extus ferrugineo-setuloso, lobis lanceolato-oblongis ca. 8 mm. longis obtusis vel acutiusculis.—Honduras: In forest near the summit of the ridge above El Achote, in cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,850 meters, August 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6267* (type in Herb. Field Mus.).

The corolla, which I have not seen, is described as pink. Among Central American species this is conspicuous because of the abundant, rusty pubescence found on almost all parts of the plant.

CENTRADENIA G. Don

Centradenia Bernoullii Cario. A shrub 60–75 cm. tall. On rocks in a ravine near El Achote.

CLIDEMIA D. Don

Clidemia dentata Don. A shrub about 3 meters tall, spreading. In forest near the summit of the range above El Achote.

Clidemia hirta (L.) Don. A shrub nearly 2 meters tall; flowers white. River bank.

Clidemia rubra (Aubl.) Mart. A shrub about 1 meter tall. Thicket.

CONOSTEGIA D. Don

Conostegia subhirsuta DC. A tree 7–8 meters tall and 7–10 cm. in diameter; flowers white, aromatic. Side of a ravine near El Achote.

Conostegia xalapensis (Bonpl.) Don. A shrub 2–3 meters tall; flowers pinkish; fruit smooth, dark purple. Common on the plains and in the pine forest.

MICONIA Ruiz & Pavón

Miconia albicans Triana. A shrub 1–2 meters tall; fruit red. Common in thickets on the plains and in the pine belt.

Miconia globulifera Naud. A small tree about 3 meters tall and 3–5 cm. in diameter. Bottom of a ravine near El Achote. New for the flora of Honduras.

Miconia humilis Cogn. A shrub about 2 meters tall. Rim of a ravine near El Achote.

Miconia longifolia DC. A small tree 4.5–6 meters tall and 5–8 cm. in diameter; fruit purplish. In a thicket in a wet ravine near El Rincón. Not recorded previously for the flora of Honduras.

Miconia Schlechtendalii Cogn. A low shrub 0.5–1 meter tall. Thicket.

TIBOUCHINA Aubl.

Tibouchina longifolia (Vahl) Baill. A shrub 60–90 cm. tall; petals white. In pine forest near El Achote.

ONAGRACEAE

JUSSIAEA L.

Jussiaea linifolia Vahl. In a marsh.

Jussiaea peruviana L. A small tree 3.5–4 meters tall. In a bog near El Achote.

Jussiaea repens L. In a marsh.

Jussiaea suffruticosa L. A weedy plant, common in moist, waste places.

ARALIACEAE

ARALIA L.

Aralia humilis Cav. A shrub about 2 meters tall. On a rocky hillside. The species is new for Honduras.

GILIBERTIA Ruiz & Pavón

Gilibertia leptopoda Donn. Sm. A tree about 6 meters tall and 8–10 cm. in diameter. In a wet ravine near El Achote. Not reported previously from Honduras.

OREOPANAX Dcne. & Planch.

Oreopanax Liebmannii March. A tree about 15 meters tall and 60 cm. in diameter. In dense forest near the summit of the range above El Achote. The tree is new for the Honduran flora.

Oreopanax peltatum Linden. A small tree about 4.5 meters tall. Ravine near El Achote. Reported previously from the same region under the name *O. Salvinii* Hemsl.

Oreopanax xalapense (HBK.) Dcne. & Planch. A tree about 3.5 meters tall and 5 cm. in diameter. In forest near the summit of the range above El Achote. An addition to the known trees of Honduras.

UMBELLIFERAE

ERYNGIUM L.

Eryngium caricinum Standl. In an old, wet pasture. The species is known only from Siguatepeque.

HYDROCOTYLE L.

Hydrocotyle umbellata L. Corolla greenish white. In a subalpine bog near El Achote; also in a low, wet area about 12 km. west of Tela.

SPANANTHE Jacq.

Spananthe paniculata Jacq. Corolla yellow. River bank, about 6 km. north of Siguatepeque.

CLETHRACEAE

CLETHRA L.

Clethra hondurensis Britton. A tree about 6 meters tall and 10 cm. in diameter; flowers greenish white. Rocky hillside.

PYROLACEAE

CHIMAPHILA Pursh

Chimaphila dasystemma Torr. Flowers white with green pistils, attractive. In partial shade, hillside near El Achote. This species and the following one are new to the flora of Honduras.

MONOTROPA L.

Monotropa coccinea Zucc. Entire plant bright red. In humus of forest floor near the summit of the range above El Achote.

ERICACEAE

ARBUTUS Adans.

Arbutus xalapensis HBK. A tree about 4.5 meters tall and 5–8 cm. in diameter; stems and petioles red. In pine forest near El Achote.

BEFARIA Mutis

Befaria mexicana Benth. A small tree about 4.5 meters tall and 5–7 cm. in diameter; inflorescence viscid; flowers white, fragrant. In a ravine near El Achote. An addition to the known trees of the country.

SPHYROSPERMUM Poepp. & Endl.

Sphyrospermum majus Griseb. Fruit light purple, fleshy. Climbing on a tree in forest near the summit of the range above El Achote. The species is new for Honduras.

THIBAUDIA Ruiz & Pavón

Thibaudia costaricensis Hoer. A tree 15–18 meters tall and about 60 cm. in diameter; fruit purplish black. In dense forest at the summit of the range above El Achote.

MYRSINACEAE

ARDISIA Sw.

Ardisia compressa HBK. A small tree about 4.5 meters tall and 8 cm. in diameter; flowers white; fruit black. Side of a ravine near El Achote.

PARATHESIS Hook. f.

Parathesis Donnell-Smithii Mez. A small tree about 4.5 meters tall and 10–12 cm. in diameter; flowers, pedicels, etc. flesh-colored. Side of a ravine near El Achote. New for the Honduran flora.

SAPOTACEAE

CALOCARPUM Pierre

Calocarpum mammosum (L.) Pierre. A tree about 15 meters tall and 60 cm. in diameter. River bank.

CHRYSOPHYLLUM L.

Chrysophyllum oliviforme L. A small tree 7–8 meters tall and 45 cm. in diameter; leaves bright green above, brown-silky beneath. River bank.

STYRACACEAE

STYRAX L.

Styrax argenteus Presl. A tree 9–10 meters tall and 50 cm. in diameter; flowers waxy-white with yellow stamens. River bank.

Styrax glabrescens Benth. A tree 6–7.5 meters tall and 12–15 cm. in diameter; fruit with a hard seed and thin pericarp. In forest near the summit of the range above El Achote. The species is new for Honduras.

OLEACEAE

FRAXINUS L.

Fraxinus hondurensis Standl., sp. nov.—Arbor 18-metralis, trunco 60 cm. diam., corona depressa lata, ramulis teretibus crassiusculis lenticellis paucis pallidis parvis conspersis, novellis dense minute patenti-pilosulis; folia modica graciliter 4–5.5 cm. longe petiolata, petiolo exalato minute pilosulo, rhachi gracili exalata vel obscure marginata minute pilosula usque 7 cm. longa; foliola 5, lateralia sessilia, vel inferiora petiolulata, terminale longe graciliter petiolulatum, lanceolata vel oblongo-lanceolata 4.5–12.5 cm. longa et ultra 1.5–4.5 cm. lata, plerumque longissime angustissime attenuato-acuminata, terminali basi longiacuminato vel acuminato, lateralibus basi saepe valide obliquis et acutis vel acuminatis, in sicco laete viridia, supra lucida, sparse minute puberula, costa ut nervis venisque prominulis, subtus fere concoloria, subsparse breviter patenti-pilosula, costa gracili elevata, nervis lateralibus utroque latere ca. 9 angulo acuto adscendentibus, venulis prominulis arcte reticulatis, foliolis remote inaequaliter serrulatis vel fere integris.—Honduras: In grove near river bank, plains near Siguatepeque, Dept. Comayagua, 1,050 meters, July 23, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6038* (type in Herb. Field Mus.).

"Bark furrowed. A fine, spreading tree." The genus is new to Honduras and probably to Central America, this being the southernmost occurrence known for it at the present time in America. The material is, unfortunately, sterile, but in leaf characters it appears to be so definitely different from any of the Mexican species that I do not hesitate to describe it as new.

LOGANIACEAE

SPIGELIA L.

Spigelia Humboldtiana Cham. & Schlecht. An herb with white flowers. In shade, river bank.

GENTIANACEAE

LEIPHAIMOS Schlecht. & Cham.

Leiphaimos parasiticus Schlecht. & Cham. A saprophytic herb, pale red below, tawny toward the top. In forest near the summit of the range above El Achote.

MENYANTHACEAE

LIMNANTHEMUM Gmel.

Limnanthemum Humboldtianum (HBK.) Griseb. Growing in water. Corolla white. Marsh near Siguatepeque.

APOCYNACEAE

MANDEVILLA Lindl.

Mandevilla tubiflora (Mart. & Gal.) Woodson. Climbing in a thicket near El Rincón. Corolla greenish yellow.

ASCLEPIADACEAE

ASCLEPIAS L.

Asclepias curassavica L. A common weed in waste places about Siguatepeque.

Asclepias guatemalensis Donn. Sm. Corolla yellowish green, horns light violet. Rocky hillside.

METASTELMA R. Br.

Metastelma pedunculare Dcne.? Sprawling over a fallen log in forest near the summit of the range above El Achote.

VINCETOXICUM Walt.

Vincetoxicum porphyranthum Standl., sp. nov.—Volubilis, gracilis, caule viridi dense minute puberulo atque pilis longis rigidis patentibus fulvis hirsuto, internodiis foliis longioribus; folia inter minora petiolata membranacea, petiolo gracili 10–17 mm. longo dense longihirsuto; lamina oblongo-ovata 3.5–6 cm. longa 1.5–2.5 cm. lata longe anguste attenuato-acuminata, basi anguste rotundata et breviter cordata, sinu lato aperto, utrinque praesertim ad nervos venasque pilis longissimis patentibus hirsuta, supra in sicco viridis, venis nervisque prominulis, subtus paullo pallidior, costa gracili prominente, nervis lateralibus utroque latere 3–4 tenerrimis angulo angusto adscendentibus, venulis inconspicuis laxe reticulatis; umbellae axillares solitariae laxe pauciflorae, pedunculo vix ultra 5 mm. longo puberulo et hirsuto, pedicellis plerumque 6–7 mm. longis dense

viscido-puberulis et sparse hirsutis, bracteis filiformibus viridibus ca. 5 mm. longis; calyx adpressus extus sparse hirsutus purpureus 5–6 mm. longus fere ad basin 5-lobus, lobis anguste lanceolato-oblongis anguste longiattenuatis; corolla in sicco fusco-purpurea 7–8 mm. longa subrotata, extus sparse puberula et hispidula, ad medium 5-loba, lobis triangulari-ovatis acutiusculis, intus sparse puberulis et sparse breviter hirsutis vel interdum fere glabris.—Honduras: Climbing in thicket near river, Siguatepeque, Dept. Comayagua, 1,050 meters, July 5, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5676* (type in Herb. Field Mus.).

Vincetoxicum trichoneuron Standl., sp. nov.—Scandens, caule gracillimo viridi subtereti puberulo et ad sulcos dense brunneo-piloso, internodiis foliis multo longioribus; folia modica petiolata membranacea, petiolo 1–2 cm. longo crassiusculo densissime brunneo-piloso; lamina oblonga 7.5–12 cm. longa 3–4 cm. lata apicem versus paullo angustata longiacuminata, basi late rotundata vel subtruncata, supra in sicco viridis, ad nervos venasque adpresso-pilosa, costa nervisque manifestis sed vix plus quam prominulis, subtus multo pallidior, molliter pilis brevibus subpatentibus brunnescentibus pilosa, ad costam densissime pilis longis brunneis rigidulis pilosa, costa gracili elevata, nervis lateralibus utroque latere ca. 6 angulo latiusculo adscendentibus irregularibus, venis manifestis conspicuis laxe reticulatis; umbellae axillares solitariae 1–3-florae, pedunculo crasso vix 5 mm. longo, pedicellis usque 1 cm. longis breviter pilosulis et sparse longipilosis; calyx viridis 7–8 mm. longus extus breviter pilosulus fere ad basin 5-lobus, lobis oblongo-lanceolatis longiacuminatis adpressis; corolla olivacea rotata fere 2 cm. lata extus minute breviter pilosula, intus glabra, ad medium 5-loba, lobis orbicularibus apice late rotundatis, intus nervis 5 longitrorsis rectis notatis et arcte reticulato-venosis.—Honduras: Twining over shrubs in pine-oak forest near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, 1,350 meters, July 30, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6211* (type in Herb. Field Mus.).

The type specimen bears a single opened corolla that unfortunately is incomplete.

CONVOLVULACEAE

CUSCUTA L.

Cuscuta strobilacea Liebm. Abundant on various herbaceous and woody hosts along river banks.

IPOMOEA L.

Ipomoea cathartica Poir. An herbaceous vine; flowers large, purplish. Climbing in a thicket. River bank.

Ipomoea digitata L. Corolla reddish. Climbing in a thicket near the beach west of Tela.

Ipomoea muricata Cav. Flowers pinkish; roots tuberous. On a rocky hillside.

Ipomoea silvicola House. Corolla purplish. Climbing in a thicket. River bank about 6 km. north of Siguatepeque.

BORAGINACEAE

HELIOTROPIUM L.

Heliotropium angiospermum Murr. Corolla white. In waste places near Potrerillos.

Heliotropium indicum L. A common weedy herb about 1 meter tall; flowers lavender. In waste places.

TOURNEFORTIA L.

Tournefortia glabra L. A shrub; fruit white. River bank about 6 km. west of Siguatepeque.

Tournefortia hirsutissima L. A scandent shrub. River bank about 5 km. northwest of Siguatepeque.

Tournefortia volubilis L. A shrub about 3 meters tall. River bank.

VERBENACEAE

CALLICARPA L.

Callicarpa acuminata HBK. A shrub about 2.5 meters tall; corolla white. In a thicket near Potrerillos.

CITHAREXYLUM L.

Citharexylum Mocinni D. Don. A shrub 1.5-2 meters high. Wet ravine near El Achote. The species is new for Honduras.

LANTANA L.

Lantana Camara L. A shrub about 3 meters tall; flowers orange. In a thicket near the shore of Lake Yojoa.

Lantana involucrata L. A shrub about 1 meter tall; flowers pink to lavender. Frequent on the plains.

LIPPIA L.

Lippia dulcis Trev. Flowers white. River bank.

Lippia Kellermanii Greenm. A tree about 6 meters tall and 7–10 cm. in diameter; corolla pale yellow. River bank about 6 km. west of Siguatepeque.

VERBENA L.

Verbena carolina L. A weedy plant in waste places.

Verbena littoralis HBK. A weedy herb about a meter tall; flowers lavender. Common in waste places.

LABIATAE

HYPTIS Jacq.

Hyptis asperifolia Standl. A shrub 1.5–2 meters tall. Side of a ravine near El Achote. The species is known only from this region.

SALVIA L.

Salvia siguatepequensis Standl. A shrub about 2 meters tall; flowers scarlet. Side of a ravine near El Achote. Known only from the region of Siguatepeque.

STACHYS L.

Stachys guatemalensis Epling. A decumbent herb with rather long stems. River bank.

SOLANACEAE

CAPSICUM L.

Capsicum macrophyllum (HBK.) Standl. A shrub or small tree about 4.5 meters tall; flowers pale yellow; berries orange. Ravine near El Achote.

CESTRUM L.

Cestrum nocturnum L. var. **mexicanum** Schulz. A shrub 1.5 meters tall. Near El Achote.

CYPHOMANDRA Sendtn.

Cyphomandra heterophylla Donn. Sm. A shrub or small tree about 3.5 meters tall. In a wet ravine near El Achote. A synonym of this is *C. mollicella* Standl.

LYCIANTHES Hassler

Lycianthes sideroxyloides (Schlecht.) Bitter. A scandent shrub. In a thicket near the summit of the range above El Achote.

MERINTHOPODIUM Donn. Sm.

Merinthopodium neuranthum (Hemsl.) Donn. Sm. Corolla green without, purplish within. A small shrub, on a tree trunk in forest near Lancetilla Valley.

PHYSALIS L.

Physalis ingrata Standl., sp. nov.—Herba perennis erecta(?) ramosa, ramis viridibus gracilibus pilis tenuibus albidis brevibus patentibus pilosis, internodiis brevibus vel elongatis; folia inter minora longipetiolata herbacea, petiolo gracili 0.8–2 cm. longo dense breviter albido-villosulo; lamina ovata vel late ovata 2–5 cm. longa 1.5–2.5 cm. lata acuta vel subacuta, rarius attenuata, basi plus minusve inaequali late rotundata ad obtusa, supra sparse breviter villosula, subtus viridis densius villosula, margine integro vel paullo undulato; flores axillares solitarii cernui (?), pedicellis fere filiformibus usque 1.5 cm. longis dense villosulis; calyx florifer 8 mm. longus campanulatus viridis dense breviter villosulus, lobis tubo aequilongis lanceolato-triangularibus attenuatis; corolla lutea ca. 12 mm. longa extus sparse puberula, fauce maculis 5 magnis atropurpureis notata; calyx fructifer anguste ovoideus basi ut videtur non depressus 1.5 cm. longus vel ultra viridis subdense breviter villosulus, lobis tubo accrescente multo brevioribus.—Honduras: On rocky hillsides above Siguatepeque, Dept. Comayagua, 1,200 meters, July 14, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5865* (type in Herb. Field Mus.). Collected also in the same region, July 11, *No. 5794*.

SARACHA Ruiz & Pavón

Saracha procumbens (Cav.) Ruiz & Pav. An herb, about 1 meter tall; flowers greenish white. River bank.

SOLANUM L.

Solanum aculeatissimum Jacq. A shrub about 1.5 meters tall; flowers greenish white. In a wet ravine near El Achote.

Solanum bicolor Mill. A shrub about 1 meter tall. In a thicket, margin of the forest at the summit of the range above El Achote.

Solanum erythrotrichum Fernald. A somewhat scandent shrub; flowers greenish white to purplish. Frequent on the plains and to the summit of the range above El Achote.

Solanum guanicense Urban? In an old pasture.

Solanum laurifolium Mill. A shrub about 1.5 meters tall; flowers purplish. In a thicket on the plains.

Solanum madrense Fernald. A shrub about 2 meters tall; flowers white. Ravine, El Achote.

Solanum nigrum L. In a thicket, river bank.

Solanum nudum L. A shrub about 2.5 meters tall; flowers white. In a thicket near El Rincón.

Solanum Seaforthianum Andr. A climbing, semi-woody vine with very attractive, purple flowers. Cultivated in gardens but collected as an escape on a river bank.

Solanum umbellatum Mill. A shrub 3–4 meters tall; flowers white. River bank.

SCROPHULARIACEAE

BACOPA Aubl.

Bacopa rotundifolia (Michx.) Wettst. In a swamp.

BUCHNERA L.

Buchnera pusilla HBK. An herb; flowers violet. In an old, wet pasture.

ESCOBEDIA Ruiz & Pavón

Escobedia laevis Cham. & Schlecht. Herb; flowers white. In wet grassland. The genus is new for Honduras.

ILYSANTHES Raf.

Ilysanthes inaequalis (Walt.) Pennell. Corolla blue at the base, becoming white toward the edges. In a subalpine bog near El Achote.

LENTIBULARIACEAE

UTRICULARIA L.

Utricularia mixta Barnh.? In a marsh.

Utricularia pusilla Vahl. Corolla golden yellow. In a marshy, alpine meadow near El Achote.

BIGNONIACEAE

AMPHILOPHIUM Kunth

Amphilopium pilosum Standl., sp. nov.—Frutex scandens, ramis quadrangulatis densissime pilis patentibus fulvis pilosis, internodiis elongatis; cirrhi pilosi apice breviter trifidi; folia 3.5–4.5

cm. longe petiolata, petiolulis 3–4 cm. longis dense longipilosis; foliola 2 membranacea rotundato-ovata vel late ovato-elliptica 8–12 cm. longa 5.5–9 cm. lata abrupte breviter acuminata, basi breviter cordata vel truncata, supra viridia sublucida sparse vel dense pilis simplicibus pilosa, subtus fere concoloria molliter, ad nervos densius, patenti-pilosa, basi 5–7-nervia, nervis pallidis prominentibus, venulis laxe reticulatis, inter venas dense minute glanduloso-puncticulata; flores purpurascentes in cymas trifloras dispositi, cymis racemosis pedunculatis, paniculis angustis usque 25 cm. longis angustis, ramis densissime fulvo-pilosis, flore centrali cymae breviter crasse pedicellato, lateralibus longipedicellatis; calyx pro genere typicus extus dense pilosus ca. 8 mm. longus, lobis late rotundatis intus minute puberulis; corolla 2.5 cm. longa extus glabra.—Honduras: Climbing in thicket along river bank on plains near Siguatepeque, Dept. Comayagua, 1,050 meters, July 25, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6683* (type in Herb. Field Mus.). Also, from the same region, July 8, *No. 5738*.

Two other species of the genus found in Central America are conspicuously unlike the present plant in having fine, stellate pubescence.

GESNERIACEAE

ACHIMENES P. Br.

Achimenes grandiflora (Schiede) DC. Corolla purple; stems red. Rocky hillside.

Achimenes longiflora DC. Flowers attractive, blue. Rocky hillside.

BESLERIA L.

Besleria laxiflora Benth. A shrub 1–2 meters tall; corolla scarlet. In a wet ravine near El Achote.

COLUMNEA L.

Columnea pilosissima Standl.? Creeping on a rotten tree trunk. Near the shore of Lake Yojoa.

Columnea rubricaulis Standl., sp. nov.—Frutex subscandens epiphyticus ramosus, ramis crassis ferrugineo-rubris subteretibus, novellis dense foliatis pilis longis adpressis albis pilosis, internodiis brevissimis; folia inter minora in sicco subcoriacea, petiolo crasso vix ultra 3 mm. longo adpresso-piloso; lamina lineari-oblonga 3.5–5.5 cm. longa ca. 8 mm. lata apicem angustum versus sensim attenuata, basi paullo obliqua obtusa vel subacuta, supra in sicco cinereo-viridis opaca glabra, costa impressa, nervis obsoletis, subtus pallidior, sparse pilis brevibus albidis adpressis pilosa vel fere glabra, ad costam crassiusculam pilis longioribus albidis et ferrugineis intermixtis adprésso-pilosa, nervis obsoletis; flores axillares, pedicellis ut videtur rubris ad 2 cm. longis dense pilis rubescentibus longis adpressis pilosis; calyx ca. 1 cm. longus, sepalis lanceolato-ovatis vel lanceolatis longe anguste attenuato-acuminatis integris vel subundulatis rubro tinctis sparse adpresse pilosis; corolla non visa.—Honduras: Climbing on a tree in forest near the summit of the range above El Achote, in the cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,850 meters, August 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6255* (type in Herb. Field Mus.).

CORYTHOLOMA Dcne.

Corytholoma Warscewiczii (Bouché & Hanst.) Standl. Corolla orange. Rocky hillside.

ACANTHACEAE

DYSCHORISTE Nees

Dyschoriste oaxacensis Kobuski. In an old, wet meadow.

PLANTAGINACEAE

PLANTAGO L.

Plantago Galeottiana Dcne. In a clearing above El Achote.

RUBIACEAE

ANISOMERIS Presl

Anisomeris protracta (Bartl.) Standl. A shrub or small tree up to 6 meters tall; flowers white or pale yellow. River bank.

Anisomeris rudis Standl., sp. nov.—Arbor 9-metralis, trunco 12–15 cm. diam., ramis gracilibus subteretibus fusco-ferrugineis, novellis dense pilis patentibus vel adscendentibus lucidis ochraceis pilosis, internodiis brevibus; stipulae deciduae lineari-subulatae erectae pilosulae; folia modica breviter petiolata crasse membranacea, petiolo crassiusculo 8–10 mm. longo dense patenti-piloso; lamina ovato-oblonga vel anguste elliptico-oblonga 7–11.5 cm. longa 2.5–5 cm. lata longe sensim anguste acuminata, basi acuta vel acuminata et saepe plus minusve decurrens, supra in sicco laete viridis sublucida sparse breviter pilis albidis hirsuta, inter venas dense transverso-lineolata, subtus concolor, densiuscule praesertim ad nervos

patenti-pilosula, ad axillas dense albido-barbata, costa gracili prominente, nervis lateralibus utroque latere 6–9 obliquis prominentibus gracillimis, nervulis subimpressis; inflorescentiae axillares solitariae capitatae vel cymulosae graciliter 1.5–2.5 cm. longe pedunculatae dense pauciflorae, pedunculo dense patenti-piloso, floribus sessilibus vel brevissime pedicellatis; hypanthium claviforme vix ultra 2 mm. longum densissime patenti-pilosulum, calycis lobis linearibus vel oblongo-linearibus attenuatis extus pilosulis intus glabris 1.5–3 mm. longis subpatentibus.—Honduras: In forest near the summit of the ridge above El Achote, in cloud zone, above the plains of Siguatepeque, 1,800 meters, August 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6253* (type in Herb. Field Mus.).

The most closely related species is *Anisomeris protracta* (Bartl.) Standl., a frequent species in Honduras, which differs in having closely appressed pubescence and very short, blunt calyx lobes.

BORRERIA Meyer

Borreria fruticosa Standl. A shrub about 60 cm. tall; corolla white. In pine forest near El Achote. Known only from this region.

CEPHAELIS Sw.

Cephaelis axillaris Sw. A shrub about 1 meter tall; flowers white. In forest near the summit of the range above El Achote.

Cephaelis elata Sw. A small tree 4.5–6 meters tall and 5–8 cm. in diameter; bracts red. In a deep, wet ravine near El Rincón. New for the flora of Honduras.

CHIOCOCCA P. Br.

Chiococca alba (L.) Hitchc. A somewhat scandent shrub; corolla golden yellow. In a thicket near Lake Yojoa.

Chiococca phaenostemon Schlecht. A tree about 4.5 meters tall and 5–8 cm. in diameter; perianth green. In a wet ravine near El Achote.

COCCOCYPSELUM P. Br.

Coccocypselum hirsutum Bartl. Flowers and fruit blue. Creeping in wet soil on a rocky hillside.

CRUSEA Cham. & Schlecht.

Crusea calocephala DC. Flowers purple. In wet soil in pine forest.

DECLIEUXIA HBK.

Declieuxia fruticosa (Willd.) Kuntze, var. **mexicana** (DC.) Standl. Corolla white. In pine forest near El Achote.

DIODIA L.

Diodia brasiliensis Spreng. var. **angulata** (Benth.) Standl. A shrub about 30 cm. tall; flowers white. Between rocks on a river bank.

GONZALAGUNIA Ruiz & Pavón

Gonzalagunia panamensis (Cav.) Schum. A shrub about 1.5 meters tall; flowers white. Near the shore of Lake Yojoa.

HAMELIA Jacq.

Hamelia patens Jacq. A shrub 3–4 meters tall; flowers orange to red. River bank.

HOFFMANNIA Sw.

Hoffmannia angustifolia Standl. Climbing in trees at the bottom of a ravine near El Achote.

Hoffmannia gesnerioides (Oerst.) Kuntze. A low, sprawling shrub; fruit scarlet, pulpy. On forest floor near El Rincón. A rare species, new to Honduras, known also from Nicaragua.

Hoffmannia nebulosa Standl., sp. nov.—Frutex metralis sparse ramosus, ramis gracilibus teretibus viridescentibus vel subochraceis, internodiis brevibus vel elongatis, novellis sparse vel densiuscule villosulis; stipulae parvae deciduae; folia modica petiolata membranacea, petiolo gracili vulgo 1–3 cm. longo dense breviter villosulo; lamina obovato-oblonga 10–16 cm. longa 4–6.5 cm. lata abrupte breviter cuspidato-acuminata, basin versus sensim angustata, basi ipsa acuta, supra in sicco laete viridis sparse vel ad nervos dense villosula cito glabrata, subtus paullo pallidior, ad costam nervosque densiuscule pilis longioribus villosa, aliter sparse brevissime villosula vel fere glabra, costa crassiuscula prominente, nervis lateralibus utroque latere ca. 1 angulo lato saepe fere recto adscendentibus arcuatis; flores in axillis fasciculati pauci, pedicellis fructiferis vix ultra 2 mm. longis villosulis; baccae juvenes oblongae 5 mm. longae paullo ultra 2 mm. latae glabrae basi obtusae; calyx ad apicem baccae persistens 0.6 mm. longus breviter acute dentatus.—Honduras: In forest near the summit of the range above El Achote, in the cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,850 meters, August 1, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6252* (type in Herb. Field Mus.).

"Flowers green," but no corollas, at least, are present on the two sheets of type material. Like most species of *Hoffmannia*, this exhibits no outstanding characters, unless in the sessile, few-flowered inflorescence. It differs in several respects from all the too numerous species that have been described from Central America.

PALICOUREA Aubl.

Palicourea Galeottiana Martens. A tree about 6 meters tall and 7–8 cm. in diameter; branches of the inflorescence golden brown. Ravine near El Achote.

PSYCHOTRIA L.

Psychotria crebrinervia Standl. A shrub about 2 meters tall. Side of a ravine near El Achote.

Psychotria erythrocarpa Schlecht. A shrub about 1.5 meters tall. In a ravine near El Achote.

Psychotria involucrata Sw. A shrub about 1 meter tall; flowers greenish; bracts red. In a thicket near the shore of Lake Yojoa.

Psychotria microdon (DC.) Urban. A shrub, somewhat scandent; flowers aromatic. In a thicket near the beach west of Tela.

Psychotria patens Sw. A shrub about 2 meters tall. In a thicket, ravine near El Rincón.

Psychotria trichotoma Mart. & Gal. A shrub about 1.5 meters tall. Bottom of a ravine near El Achote.

Psychotria uliginosa Sw. A shrub about 1 meter tall; corolla pinkish; fruit scarlet. In a deep, wet ravine near El Rincón.

Psychotria Yunckeri Standl., sp. nov.—Subgen. *Mapouria.* Arbuscula 3–4.5 m. alta, trunco 2.5–5 cm. diam., omnino glabra, ramis crassis subteretibus fusco-ferrugineis interdum striatis, internodiis brevibus; stipulae ut videtur primo connatae et calyptriformes caducae ferrugineae oblongo-lineares ad 3.3 cm. longae 3–3.5 mm. latae attenuato-acutae; folia majuscula longiuscule petiolata firme membranacea, petiolo crassiusculo 1.5–3 cm. longo; lamina elliptica vel oblongo-elliptica 10–20 cm. longa 4.5–7.5 cm. lata acuta vel acuminata, basin versus attenuata et interdum subabrupte acuminata atque decurrens, supra in sicco brunneo-fuscescens, costa nervisque conspicuis sed vix prominulis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere ca. 15 angulo latius-

culo adscendentibus parum curvis prope marginem arcuato-conjunctis prominulis, venulis obsoletis; inflorescentia terminalis erecta cymoso-paniculata dense vel sublaxe multiflora crasse 1–2 cm. longe pedunculata vel interdum sessilis 4–6.5 cm. longa et saepe aequilata, ramis basalibus 3 vel numerosis adscendentibus crassis, bracteis parvis caducis, floribus plerumque umbellatis breviter crasse pedicellatis vel sessilibus, pedicellis vix 2 mm. longis; hypanthium obovoideum vix ad 1.5 mm. longum, calyce ca. 1 mm. alto 2–2.5 mm. lato truncato vel obscure remote brevissime denticulato; corolla viridi-alba 5 mm. longa extus glabra fauce albo-barbata, in alabastro apice late obtusa, tubo crasso cylindraceo, lobis ovato-oblongis obtusis aequilongis vel paullo brevioribus; pedicelli fructiferi usque 6 mm. longi; fructus globoso-obovoideus 7 mm. longus, basi obtusus, apice late rotundatus, 5 mm. diam., pyrenis 2 dorso grosse obtuse 6-costatis, facie commisurali anguste leviter canaliculatus.—Honduras: In forest near the summit of the range above El Achote, in cloud zone, above the plains of Siguatepeque, Dept. Comayagua, 1,850 meters, July 21, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6013* (type in Herb. Field Mus.); also *No. 6143* from the same locality. In ravine near El Achote, 1,350 meters, *No. 6118.*

RANDIA L.

Randia aculeata L. A shrub about 2.5 meters tall; flowers white. Near El Achote.

RONDELETIA L.

Rondeletia amoena (Planch.) Hemsl. A tree about 4.5 meters tall. Side of a ravine near El Achote.

Rondeletia buddleoides Benth. A tree about 4.5 meters tall and 10 cm. in diameter. In a dry ravine east of Siguatepeque.

Rondeletia nebulosa Standl. A small tree about 4.5 meters tall and 8–10 cm. in diameter. In forest near the summit of the range above El Achote. The species is confined, so far as known, to Honduras.

Rondeletia strigosa (Benth.) Hemsl. A shrub. Edge of a ravine near El Achote.

CAPRIFOLIACEAE

VIBURNUM L.

Viburnum discolor Benth. A tree about 7.5 meters tall and 15 cm. in diameter; flowers white. Side of a ravine near El Achote.

VALERIANACEAE

VALERIANA L.

Valeriana scorpioides DC. An herb; flowers white. Rocky hillside.

CUCURBITACEAE

LAGENARIA Ser.

Lagenaria siceraria (Mol.) Standl. Flowers white. Climbing in a thicket on river bank about 6 km. north of Siguatepeque. Escaped from cultivation?

LOBELIACEAE

LOBELIA L.

Lobelia splendens Willd. In a subalpine bog near El Achote. Corolla scarlet.

COMPOSITAE

ACHYROCLINE Less.

Achyrocline Yunckeri Blake, sp. nov.—Pl. XVI. Annua paullum erecto-ramosa ca. 6 dm. alta; caulis canescenti-tomentosus; folia ovata v. elliptico-ovata acuta basi cuneata petiolata non decurrentia integra triplinervia supra cinerascentia v. aetate viridescentia tenuiter tomentosa subtus canescenti-tomentosa; capitula 5-flora sessilia glomerato-paniculata; fl. fem. 4, hermaph. 1; involucri scariosi margaritacei phyllaria late ovalia v. oblonga obtusa saepius apiculata.

Erect, leafy annual; stem subterete, striate, pithy, 3 mm. thick below; leaves alternate, the internodes 0.6–2.5 cm. long; petioles slender, essentially unmargined, canescent-tomentose, 3–6 mm. long; blades ovate, elliptic-ovate, or sometimes elliptic, 3.8–6.5 cm. long, 1.8–2.4 cm. wide, acutish or the lower ones sometimes obtuse, dark-callous-apiculate, above usually grayish or in age greenish, rather thinly tomentose and beneath the tomentum puberulous with short, thick, several-celled hairs (from which the long hairs of the tomentum arise), not glandular, beneath densely and persistently canescent-tomentose, papery, pliable, erectish to spreading or in age marcescent and reflexed, the upper gradually reduced to lanceolate or elliptic bracts 1.8–3 cm. long; panicle terminal, flat, with about 3 principal branches, many-headed, 7 cm. wide, pubescent like the stem, the bracts subulate, 5 mm. long; heads sessile, glomerulate, oblong-ovoid (moistened), about 4.2 mm. long, 2 mm. thick; involucre about 4-seriate, strongly graduate, 4.2 mm. high, scarious, pearly white, the phyllaries about 9–11, the outermost broadly oval, 2.8–3 mm. long, 1.5–1.8 mm. wide, obtuse or rounded, sometimes apiculate, the others oblong, obtuse to subtruncate, abruptly apiculate, all with greenish, stipitate-glandular, and more or less tomentose midline below; pistillate corollas nearly equaling the style, whitish, filiform, 3 mm. long, minutely 5-toothed, puberulent at the apex with clavate, subglandular hairs; disk corolla apparently brownish at the apex, 3.5 mm. long (tube 1 mm., throat slender, 2 mm., teeth triangular, acute, puberulous with clavellate hairs, 0.5 mm. long); achenes oblong, light-colored, glabrous, 0.5 mm. long; pappus deciduous, of barely serrulate, white bristles, 3 mm. long.

HONDURAS: On a wet cliff near El Achote, hills above the plains of Siguatapeque, Dept. Comayagua, alt. 1,350 meters, July 15, 1936, *T.G. Yuncker, R.F. Dawson & H. R. Youse 5872* (type No. 1,637,728, U. S. Nat. Herb.).

The closest relative of this species, *Achyrocline deflexa* Robins. & Greenm., of Oaxaca, has longer and relatively narrower, lanceolate or oblanceolate leaves with the petiole less abruptly demarked from the blade and margined or winged to the base, and the phyllaries, varying from obtuse to acute, are indistinctly or not at all apiculate.

AGERATUM L.

Ageratum conyzoides L. A common weed in waste places.

ASTER L.

Aster bullatus Klatt. Rays white. River bank.

BACCHARIS L.

Baccharis glutinosa Pers. A small tree about 6 meters tall and 7–8 cm. in diameter. On a river sandbar.

Baccharis trinervis (Lam.) Pers. A shrub about 2 meters tall. Thicket on plains.

BIDENS L.

Bidens pilosa L. var. **radiata** Sch. Bip. A very common weed.

CHAPTALIA Vent.

Chaptalia nutans (L.) Polak. Rays purplish or white. In wet, rocky soil in pine forest.

COSMOS Cav.

Cosmos crithmifolius HBK. Rays pink. River bank.

ERIGERON L.

Erigeron jamaicensis L. In a moist pasture.

Erigeron spathulatus Vahl. Rays white. River bank.

EUPATORIUM L.

Eupatorium ivaefolium L. Corolla lavender. In an old pasture.

Eupatorium ligustrinum DC. A shrub about 2.5 meters tall. Edge of a ravine near El Achote.

Eupatorium macrocephalum Less. In an old pasture.

Eupatorium morifolium Mill. A tree about 6 meters tall and 10 cm. in diameter. In a wet ravine near El Achote.

GALEANA Llave

Galeana pratensis (HBK.) Rydb. A common weed.

HIERACIUM L.

Hieracium hondurense Blake. Rays yellow. In wet soil, in pine forest.

MELAMPODIUM L.

Melampodium brachyglossum Donn. Sm. A common weed.

MIKANIA Willd.

Mikania Tonduzii Robinson. Sprawling over shrubs in a wet ravine near El Achote.

ORTHOPAPPUS Gleason

Orthopappus angustifolius (Sw.) Gleason. Corollas pale lavender. In an old pasture.

PECTIS L.

Pectis sp. Rays yellow. In short grass of an old pasture.

PEREZIA Lag.

Perezia nudicaulis Gray. Flowers white. On a rocky hillside.

POLYMNIA L.

Polymnia maculata Cav. Stems 2.5–3.5 meters tall; leaves up to 45 cm. long; corollas yellow. About 6 km. north of Siguatepeque.

Polymnia oaxacana Sch. Bip. Stems about 1.2 meters tall; rays orange-yellow. River bank.

SENECIO L.

Senecio arborescens Steetz. A small tree about 4.5 meters tall and 8 cm. in diameter; leaves fleshy. Side of a ravine near El Achote.

SONCHUS L.

Sonchus oleraceus L. Side of a trail about 6 km. west of Siguatepeque.

TAGETES L.

Tagetes filifolia Lag. Rays white, shading to yellow in the throat. In pine forest near El Achote.

Tagetes Schiedeana Less. Rays orange; very aromatic. In wet soil, border of a banana plantation.

TRIDAX L.

Tridax procumbens L. Rays buff. In wet soil near Potrerillos; also on a rocky hillside near Siguatepeque.

VERBESINA L.

Verbesina vicina Blake, sp. nov.—Pl. XVII. Arbor parva, ramis strigillosis glabratis; folia alterna majuscula obovata breviter acuminata basi longe cuneata petiolata crenato-mucronulata pergamentacea utrinque viridia supra asperule hirsutula pilis basi ima lepidotis, subtus non dense hirsutula; capitula minuscula aurea radiata cymoso-paniculata vix numerosa; radii ca. 5 mm. longi; achaenia latiuscule alata.

"Small tree about 4.5 meters tall and 5-7.5 cm. in diameter"; branches usually densely strigillose or subappressed-hirsutulous, in age glabrescent or glabrate, subterete, wrinkled-striatulate, wingless, the younger greenish, the older gray-barked, 3–4 mm. thick; petioles rather slender, flattish above, rounded beneath, strigillose or erectish-hispidulous especially above, 1–1.8 cm. long, not auriculate or decurrent; blades obovate, (7–) 11.5–23 cm. long, (3–) 4–7.5 cm. wide, usually rather abruptly short-pointed with an acute, callous-tipped apex, rarely obtuse, crenate-mucronulate above the entire, cuneate base (teeth 8–12 pairs, 5–20 mm. apart, the mucro callous, about 0.4 mm. high), above deep green, somewhat shining, roughish, evenly but scarcely densely hirsutulous with subappressed or antrorse hairs with lepidote but scarcely or not tuberculate base, densely hirsutulous on the costa, in age glabrescent and inconspicuously lepidote-maculate, beneath scarcely lighter green, evenly but not densely hirsutulous or substrigillose with inconspicuously lepidote-based hairs, feather-veined, the costa prominent beneath, the chief lateral veins 8–10 pairs, prominulous beneath, curved-ascending; cymes or cymose panicles axillary, subterminal, much surpassed by the leaves, about 3–10-headed, 1.5–3.5 cm. wide, convex, densely erect- or ascending-pilosulous, the peduncle about 1.5 cm. long, the pedicels slender, 5–17 mm. long, the bracts minute; heads about 1 cm. wide; disk campanulate, 8–10 mm. high, 5–8 mm. thick (as pressed); involucre 3–4-seriate, 4.5–6 mm. high, appressed, the phyllaries rather few, very unequal, graduate, the outermost minute, ovate, the others oblong or ovate-oblong, 0.8–1.2 mm. wide, with pale, somewhat indurate, about 2-ribbed base and longer or shorter, greenish tip, all obtuse, loosely and not densely pilosulous and short-ciliate; rays 4, yellow, pistillate, the tube spreading-pilosulous, 1.8 mm. long, the lamina oval, 3-dentate, 9-nerved, 5.5 mm. long, 3.3 mm. wide; disk flowers not very numerous, their corollas yellow, hirsutulous on the tube and base of throat, otherwise glabrous, 4.7–5.2 mm. long (tube 0.8–1 mm., throat cylindric, 3.5–3.7 mm., teeth 4 or 5, ovate, papillose-margined, obtuse, 0.5–0.7 mm. long); pales rather broad, several-vittate, sparsely pilosulous, thinner and greenish toward the obtuse, erect or very slightly spreading tip, about 5 mm. long; disk achenes cuneate-obovate, 4.8 mm. long, 3.2 mm. wide (including the wings), the body narrowly obovate, blackish, sparsely hirsute above with partly tuberculate-based hairs, 4.5 mm. long, 1.8 mm. wide, the thin, whitish wings (probably not fully mature) dentate-ciliate, 0.6–0.8 mm. wide; awns 2, unequal, linear-lanceolate, acuminate, sparsely hirsutulous-ciliolate, somewhat divergent, 2.2–3.2 mm. long, adnate dorsally to the wings at the base.

HONDURAS: In a ravine, bank of a stream near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, alt. 1,350 meters, July 17, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 5907* (type No. 1,637,745, U. S. Nat. Herb.).

In range and characters this species is intermediate between *V. pleistocephala* (Donn. Sm.) Robinson, of Guatemala, and *V. Oerstediana* Benth., of Costa Rica. The inflorescence of the specimens examined (including those retained by Dr. Yuncker) is probably dwarfed and not representative of the species in its full development. In *V. pleistocephala* the leaves are only about half the size of those of *V. vicina,* usually sharply serrate or serrulate, and extremely rough above with strongly tuberculate-based but scarcely lepidote hairs. In *V. Oerstediana* the leaves are smooth to the touch above and there usually glabrous (except along the puberulent costa), or sometimes sparsely pilosulous.

Verbesina Oerstediana Benth. (in Oerst. Vidensk. Medd. 1852: 96. 1852) was recorded as one of the most characteristic plants on the southern slopes of Mount Irazú, Costa Rica, at 8,000–9,500 feet altitude. The type at Kew is labeled as from 9,000 feet; a photograph and fragments from this sheet are in the U. S. National Herbarium, which also possesses a sheet collected by Oersted bearing essentially the same data and presumably belonging to the type collection. Bentham described the branches as well as the panicle as villous; Robinson & Greenman (Proc. Amer. Acad. 34: 558. 1899), who had examined only *Pittier 11583*, from Irazú (the altitude given on the specimen of this number in the U. S. National Herbarium is 2,900–3,000 meters; Robinson and Greenman give the altitude as 2,000–2,500 meters [about 6,500–8,200 feet], which may be due to an error in labeling) called them lanate. In the specimen of *Pittier 11583* in the U. S. National Herbarium the branches and petioles are villous-lanate, and the panicle correspondingly pubescent; the pubescence on the Oersted specimen, although much weathered, has been essentially the same. The leaves were described by Bentham in his diagnosis as pilosulous above, loosely villous beneath, in his fuller description as scabriusculous above, at length nearly glabrate. The leaves are essentially the same in all three specimens above cited—at first evenly but not densely pilosulous above with hairs that are not at all or only very slightly tuberculate-thickened at the base, and smooth to the touch, in age glabrate or glabrescent above.

Eight other collections from Costa Rica that have been referred to *V. Oerstediana* are in the U. S. National Herbarium, all collected in the provinces of San José and Cartago by Paul C. Standley, and all, with a single exception, from altitudes of 1,500–1,900 meters. In all these plants the pubescence of the branches and panicle is much less conspicuous, shorter, and usually sparse, varying from strigillose to spreading-pilosulous. They appear to represent a distinct variety of lower altitudes, which may be called

Verbesina Oerstediana var. **glabrior** Blake, var. nov.—Rami novelli et paniculae sparse v. dense strigillosa v. strigosa, vel interdum pilosula pilis adscendentibus v. subpatentibus; folia supra glabra v. subglabra, subtus sparse v. sparsissime pubescentia.

COSTA RICA: Province of San José: Moist woods, Cerro de Piedra Blanca, above Escasú, Jan., 1924, *Standley 32489*; moist forest, between Aserrí and Tarbaca, alt. 1,600–1,900 meters, Feb., 1924, *Standley 34142*; open slope, Cerro de Las Vueltas, alt. 2,700–3,000 meters, Dec., 1925–Jan., 1926, *Standley & Valerio 43504*; oak forest, vicinity of Santa María de Dota, alt. 1,500–1,800 meters, Dec., 1925, *Standley 41619* (type No. 1,252,372, U. S. Nat. Herb.); Dec., 1925–Jan., 1926, *Standley & Valerio 43448*.—Province of Cartago: Wet forest, Cerro de La Carpintera, alt. 1,500–1,850 meters, Feb., 1924, *Standley 35715, 35728*; wet forest, La Estrella, March, 1924, *Standley 39429*.

VERNONIA Schreb.

Vernonia melanocarpa (Gleason) Blake. A shrub about 3 meters tall. In a thicket on river bank.

WEDELIA Jacq.

Wedelia parviceps Blake. Stems more or less woody at the base; rays yellow. In a thicket on river bank.

ZEXMENIA Llave

Zexmenia frutescens (Mill.) Blake, form. A shrub 1.5–2 meters tall. In a thicket on the plains.

Zexmenia perymenioides Blake, sp. nov.—Pl. XVIII. Arbor parva; rami tenues hispiduli et strigillosi etiam patenti-hispidi; folia elliptico-lanceolata acuminata basi acute cuneata petiolata serrulata triplinervia supra aspere hispida et hispidula, pilis basi tuberculatis, subtus pallidiora hirsuta et hirsutula; capitula 3 terminalia pedunculata foliis breviora radiata aurantiaca, pedunculis strigillosis; involucri 3-seriati paullum gradati phyllaria exteriora oblonga strigosa apice herbaceo ovato acuto squarroso, interiora angustiora scariosa; achaenia immarginata tuberculato-hispidula; pappi arista 1 tenuis achenio paullo brevior, squamellae ca. 2–3 saepius ovatae ca. 1 mm. longae.

"A small tree about 15–20 feet (4.5–6 meters) tall and 3 inches (7.5 cm.) in diameter"; branch hexagonal, 2 mm. thick, sparsely branched, greenish, rather densely hispidulous with spreading or reflexed hairs and in places strigillose, also rather densely hispid with wide-spreading, slightly tuberculate-based hairs about 1 mm. long, the pubescence especially dense at the nodes; petioles slender, essentially naked, pubescent like the branch, 3–9 mm. long; blades 6–8.5 cm. long, 1.8–2.7 cm. wide, rather shortly falcate-acuminate with an acute, callous-tipped apex, serrulate above the subentire, cuneate base, firm-papery, above deep green, not shining, evenly but scarcely densely hispid and hispidulous with tuberculate-based, antrorse hairs, beneath lighter green, on the veins densely and rather softly hirsute with spreading to subappressed hairs, on the surface evenly hirsutulous with spreading to subappressed hairs, triplinerved 3–10 mm. above the base, in age with the smaller veins impressed above, prominulous-reticulate beneath; peduncles 3.5 cm. long or less, very slender, densely strigillose, 1-headed; heads 2.5 cm. wide (as pressed); disk campanulate, about 12 mm. high, 8 mm. thick (as pressed); involucre campanulate, impressed at the base, 3–4-seriate, slightly graduated, 10 mm. high, the phyllaries rather few, those of the 2 outer series together 6–8, oblong or oblong-obovate, 1.5–2.8 mm. wide, with indurate (in the inner greenish-centered, scarious-margined) base and shorter, ovate or lance-ovate, usually acute or acuminate, rarely obtusish, squarrose, herbaceous tip, densely strigillose on their exposed surface below, more sparsely so and indistinctly ciliate on the herbaceous tip, those of the inner series linear-oblong, obtuse, scarious, erose and usually ustulate at the tip, appressed, strigillose along the midline; rays 8, fertile, the tube very sparsely subglandular-puberulous above, 3.3 mm. long, the lamina oval, tridenticulate, 12–14 mm. long, about 8 mm. wide, short-hirsute on the back on the 2 chief nerves and finely hispidulous at the apex, about 17-nerved; disk corollas golden yellow, glabrous except for the sparsely hispidulous, papillose-margined teeth, 8.7 mm. (tube 3 mm., throat slender-funnelform, 4.5 mm., teeth ovate, 1.2 mm. long); pales narrow, scarious, acuminate, often with a lateral tooth on each side below the apex, ciliolate toward the tip, sparsely hispidulous on the midline above, about 11 mm. long; ray achenes narrowly cuneate, 5.5 mm. long, 1.7 mm. wide, trigonous, keeled on the inner face, somewhat rounded and 1–3-nerved on the outer, wingless and marginless, blackish brown, evenly but not densely tuberculate-hispidulous, not obviously contracted at the apex, their pappus of 3–4 lanceolate (rarely linear) to ovate or obovate, mostly acuminate, hispidulous-ciliolate squamellae or paleae, 0.8–1.5 mm. long, that on the inner angle sometimes aristiform and 3.5 mm. long; disk achenes narrowly cuneate, 5–5.3 mm. long, 1.2–1.5 mm. wide, compressed-quadrangular, normally with 1 nerve between each pair of angles, marginless and wingless, slightly rounded at the apex but not at all necked, blackish brown, sparsely tuberculate-hispidulous, their pappus rather persistent, of 1 narrowly lanceolate, long-acuminate, hispidulous awn about 4.5 mm. long (on the inner angle), and 2–3 slender-subulate to ovate, acute, hispidulous-ciliolate, free squamellae 0.5–1.3 mm. long, or the latter lacking.

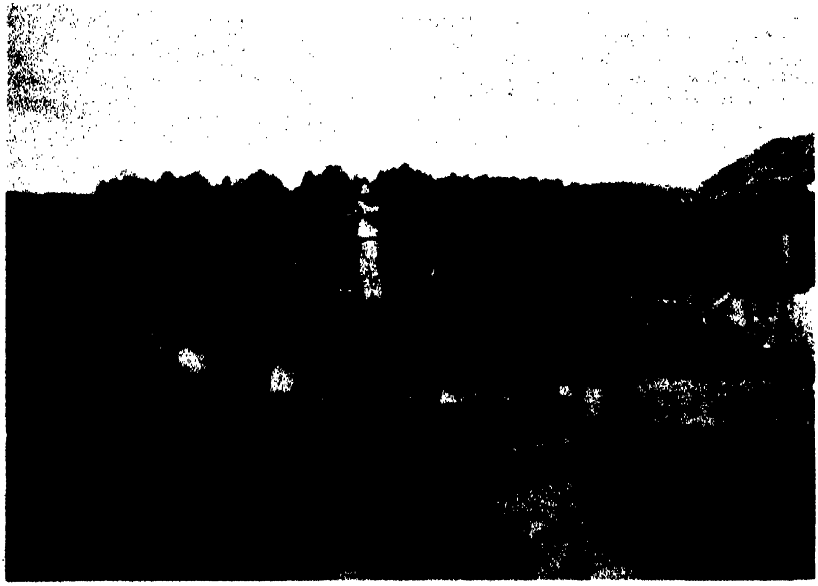
HONDURAS: In a wet ravine near El Achote, hills above the plains of Siguatepeque, Dept. Comayagua, alt. 1,350 meters, July 26, 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6099* (type No. 1,637,729, U. S. Nat. Herb.).

This species is strikingly suggestive of *Perymenium* in all features except the achene and pappus. Its closest ally is clearly *Z. aurantiaca* Klatt, of Costa Rica. In that species, of which two sheets of the type collection (*Tonduz 9836* and its equivalent, *J. D. Smith 7071*) are before me, the stem and branches are closely strigillose without any spreading hairs, the leaves are ovate and much broader (only twice as wide as long), and the heads are somewhat thicker and on longer peduncles. In essential characters of achene and pappus the two species are very similar, although no achene examined has the pappus squamellae as large as on some of the achenes of *Z. perymenioides*. W. W. Jones (Proc. Amer. Acad. 41: 161. 1905 ["A revision of the genus *Zexmenia*," Contr. Gray Herb. 30: 161]) thought that *Z. aurantiaca* might not be a *Zexmenia*, and suggested that the pappus somewhat resembled that of *Perymenium*. The species, however, is certainly a *Zexmenia*, although it was probably improperly placed in the subgenus *Auchenocarpa* by Jones. His description of the pappus as of "very fragile plumose awns, generally only one as long as the body, and several unequal bristle-like squamellae," although based on Klatt's type, gives a very misleading notion of the pappus actually present in this species. The ray achenes are 3-angled, those of the disk 4-angled (this feature reversed in his description), tuberculate-hispidulous, and very closely similar to those of *Z. perymenioides* above described. The pappus in the ray achene consists of a very slender, fragile, hispidulous awn 5 mm. long, slightly dilated at the base, on the inner angle, a similar but much shorter awn (1.8 mm. long) on each of the outer angles, and about 5–6 lanceolate, hispidulous squamellae 0.5–1 mm. long, the whole slightly connate at base. The disk achene bears one very slender, fragile, hispidulous awn 5 mm. long, sometimes paleaceous-dilated at the base (probably representing connation with 2 squamellae), and about 6–12 mostly lanceolate, hispid-ciliate squamellae, the latter shortly but distinctly connate at the base.

TYPICAL VIEW ALONG THE ROAD IN THE INTERIOR OF HONDURAS

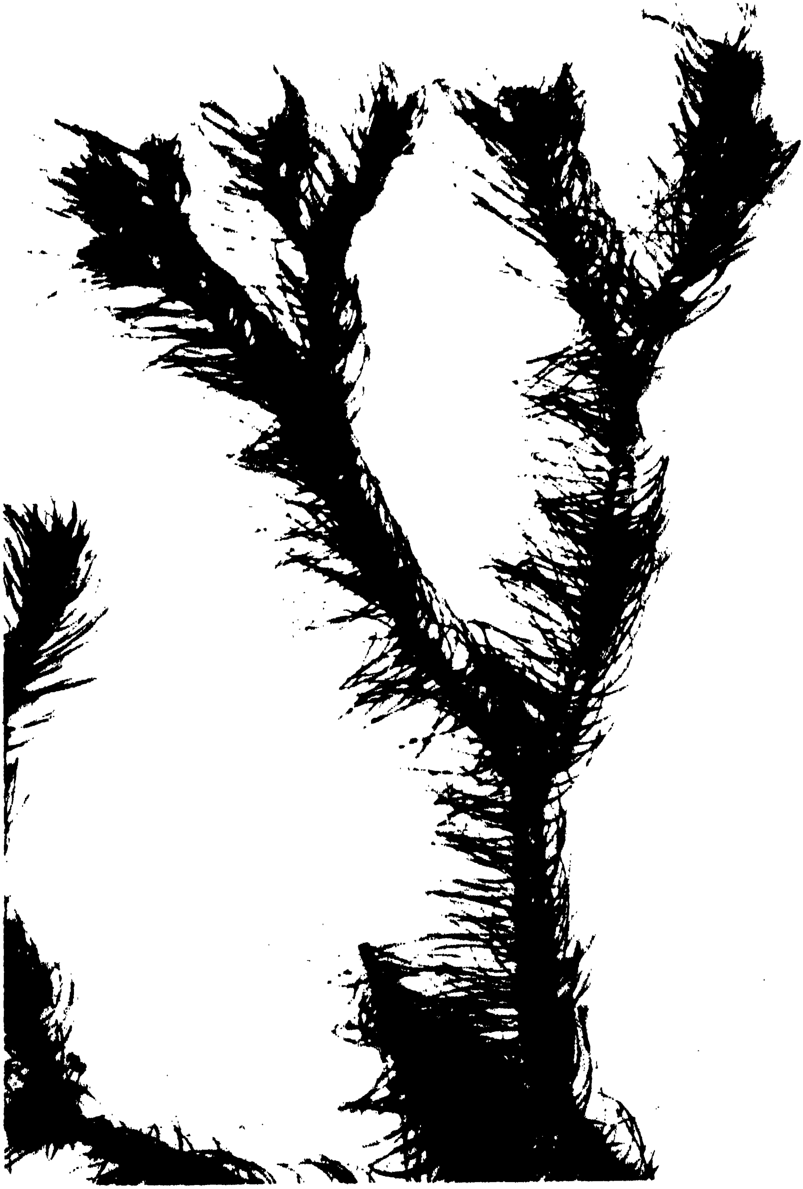
a

VIEW OF SIGUATEPEQUE, HONDURAS



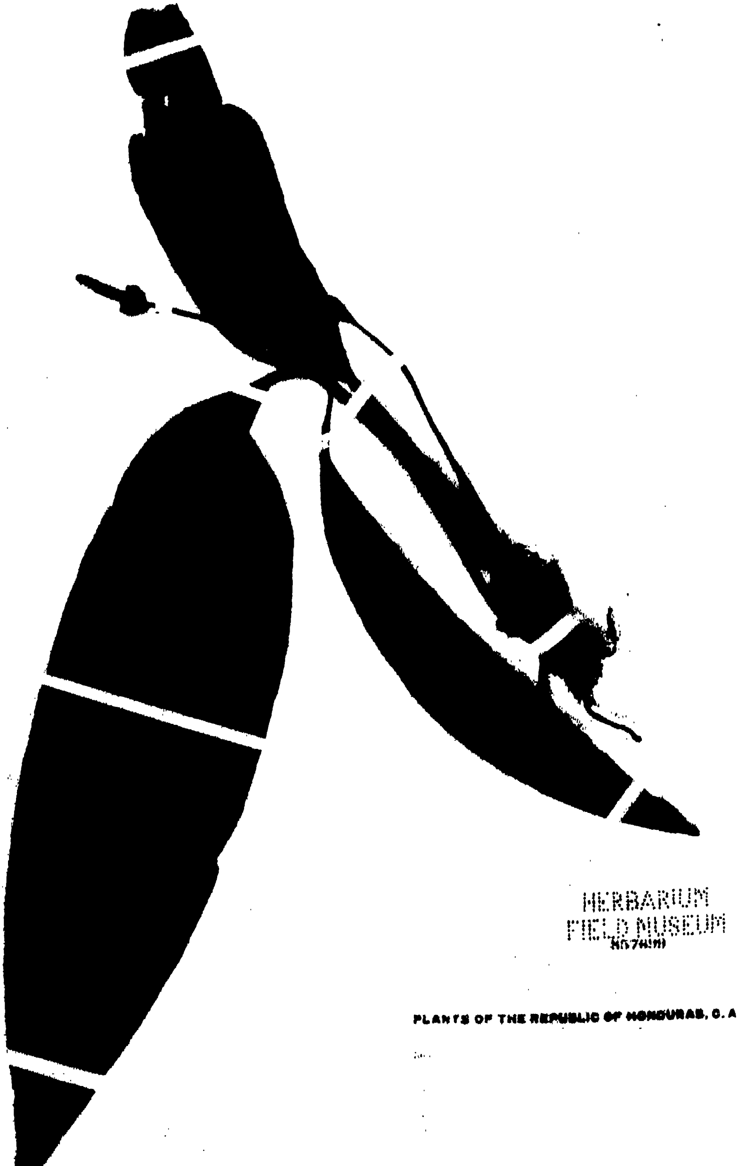
b

HAND-SAWING PINE LOGS INTO BOARDS FOR USE IN LOCAL CONSTRUCTION



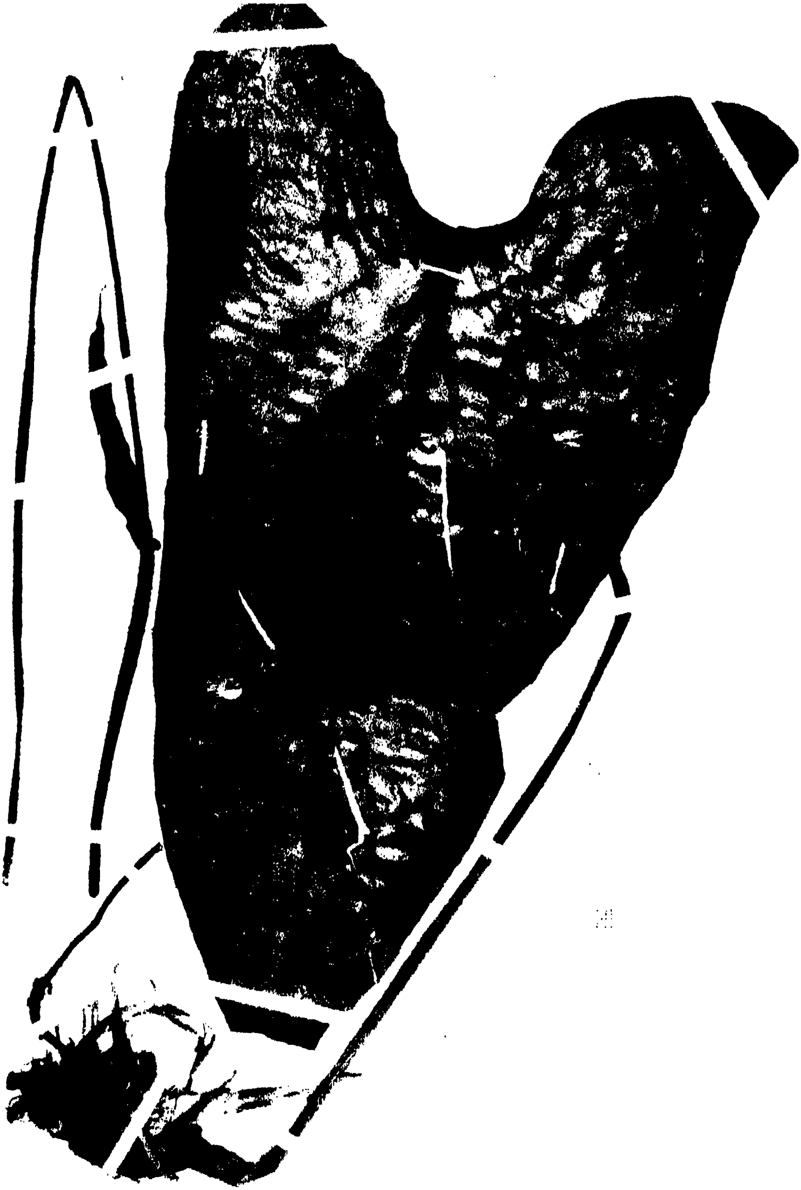
LYCOPODIUM ARCANUM MAXON

Type specimen; natural size



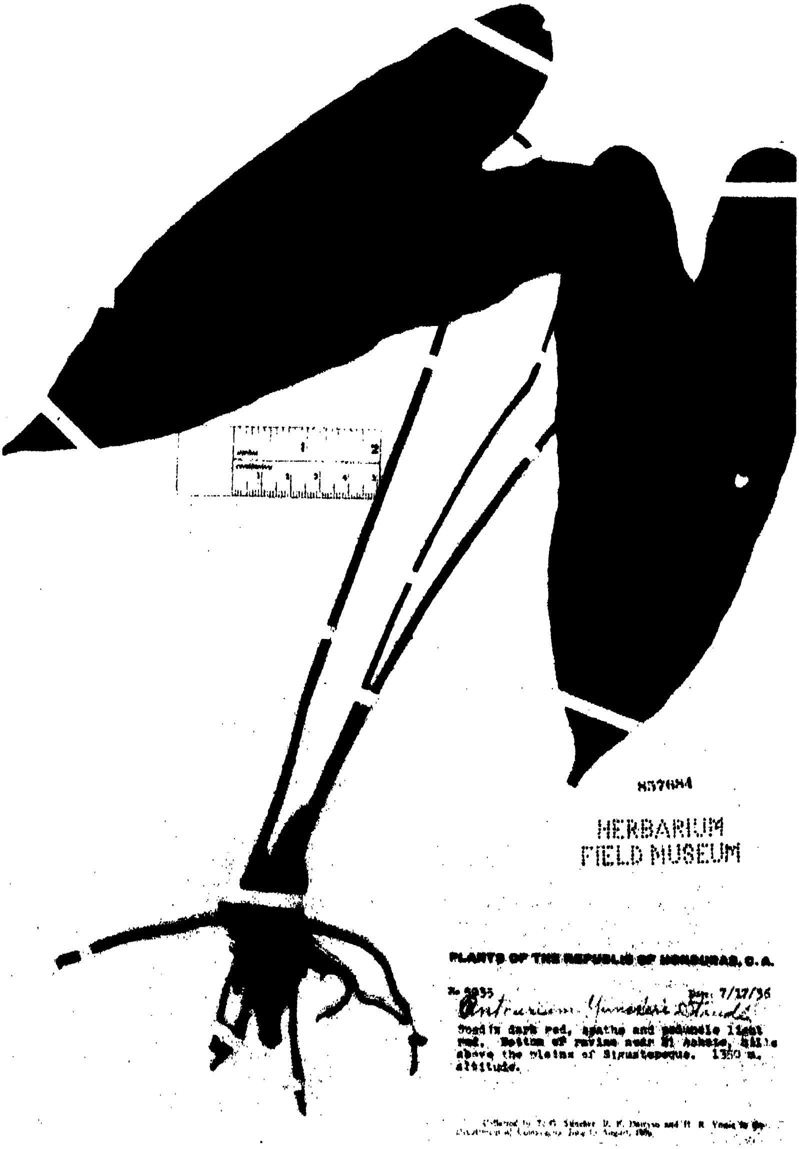
ANTHURIUM BASIATTENUATUM STANDLEY

Type specimen; one-third natural size



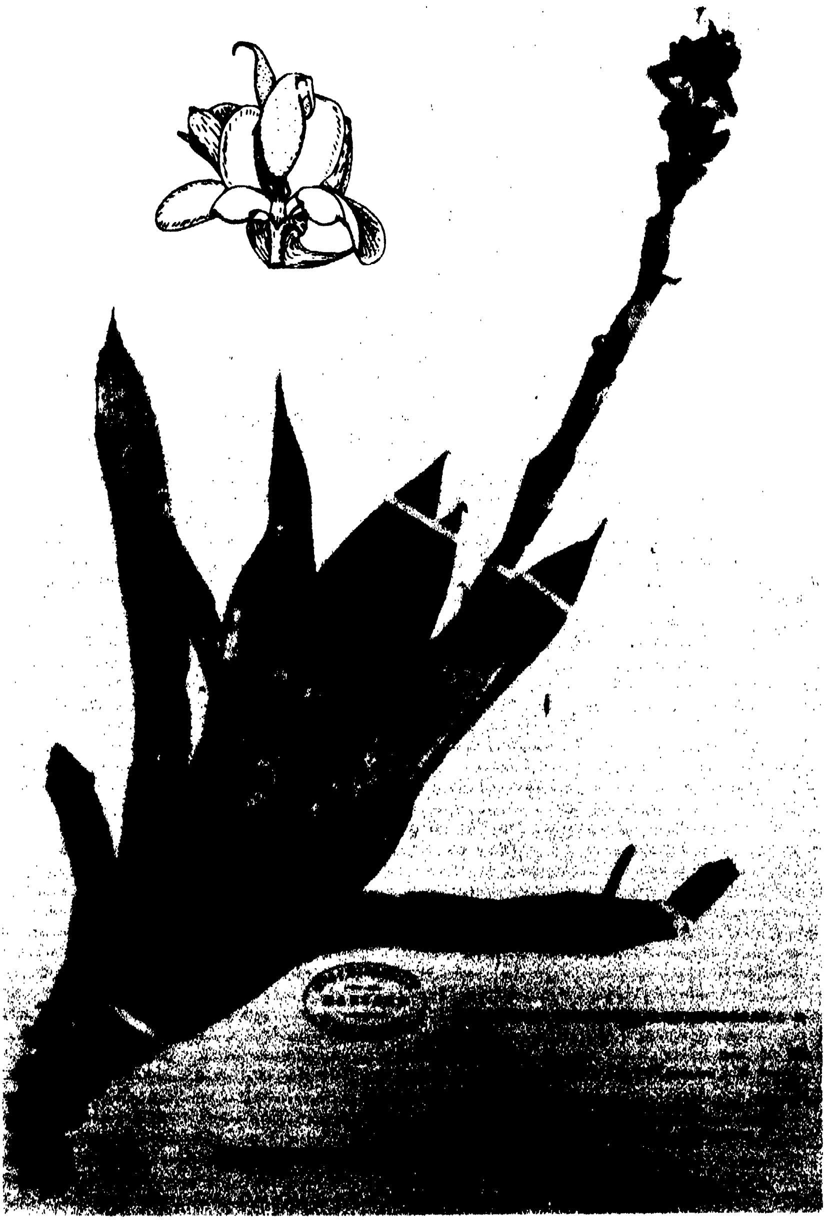
ANTHURIUM LUCENS STANDLEY

Type specimen; one-third natural size



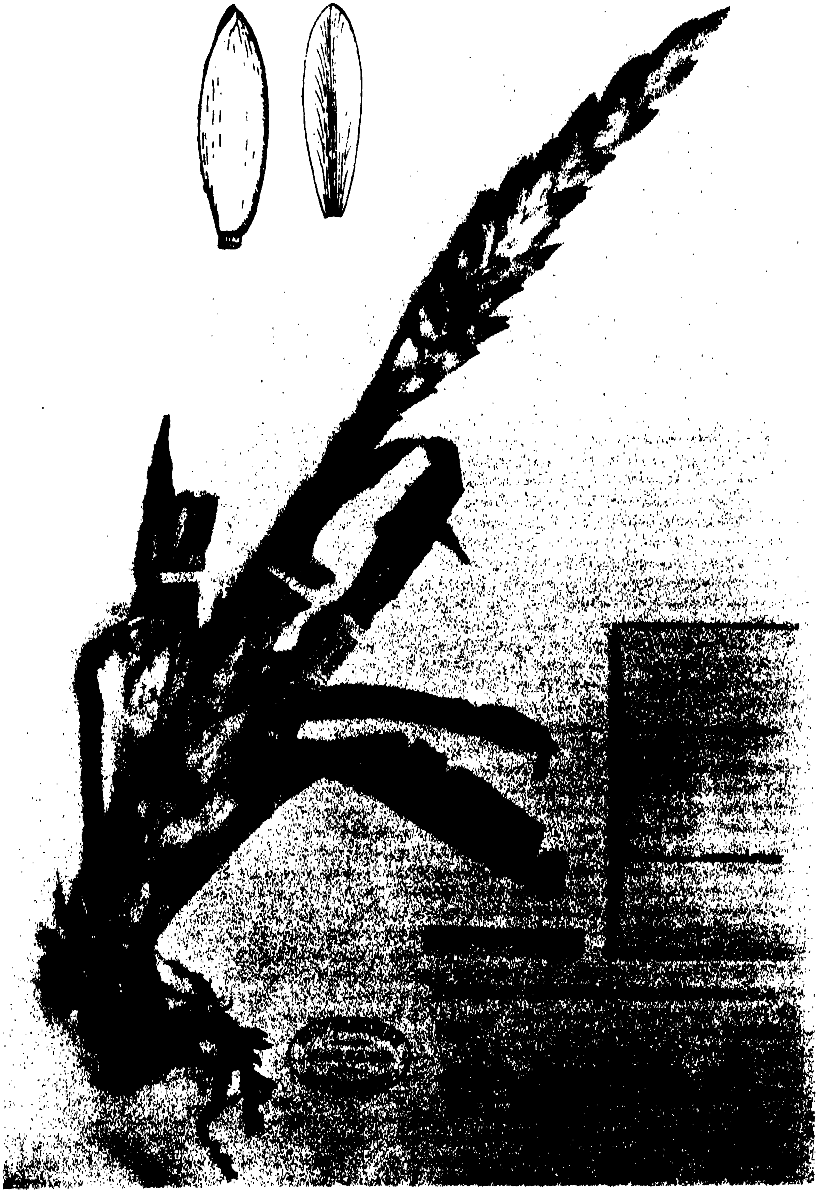
ANTHURIUM YUNCKERI STANDLEY

Type specimen; one-third natural size



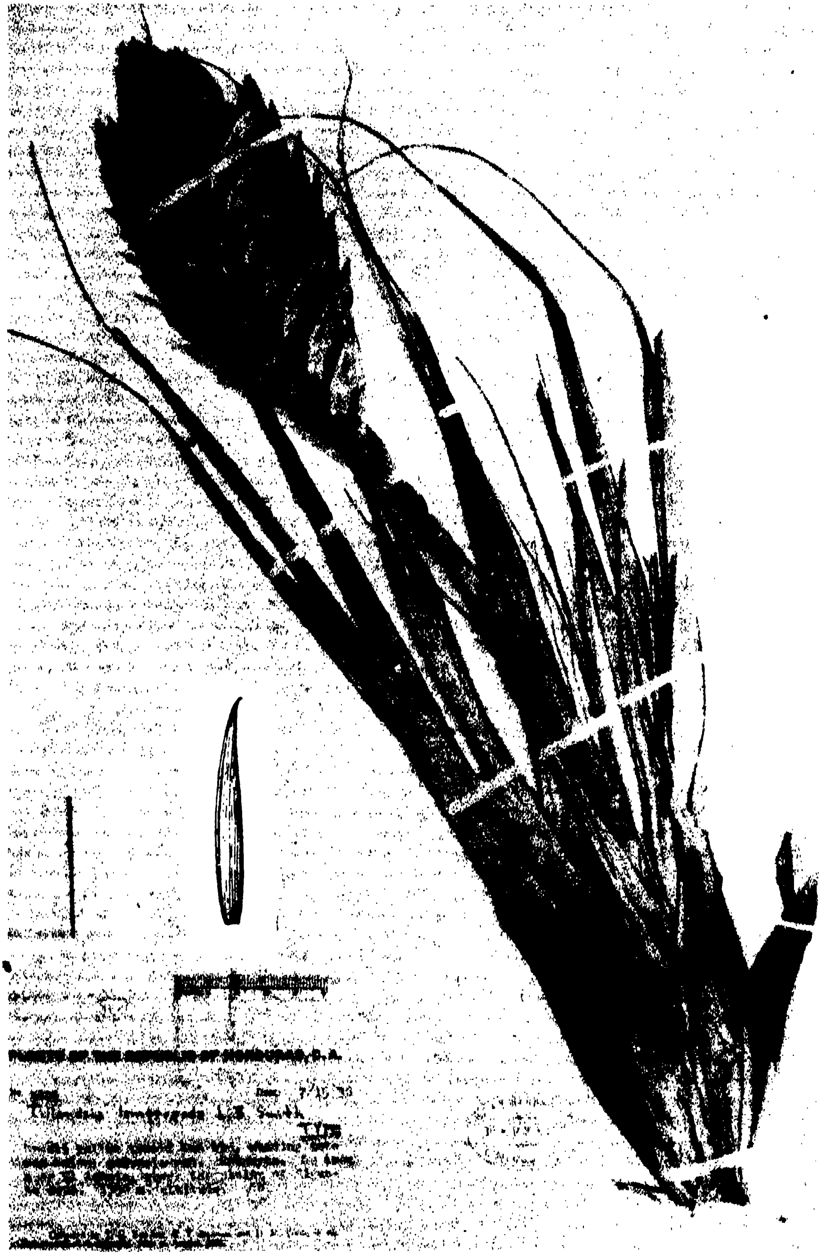
THECOPHYLLUM MONTANUM L. B. SMITH

Type specimen; one-third natural size; details of flower natural size



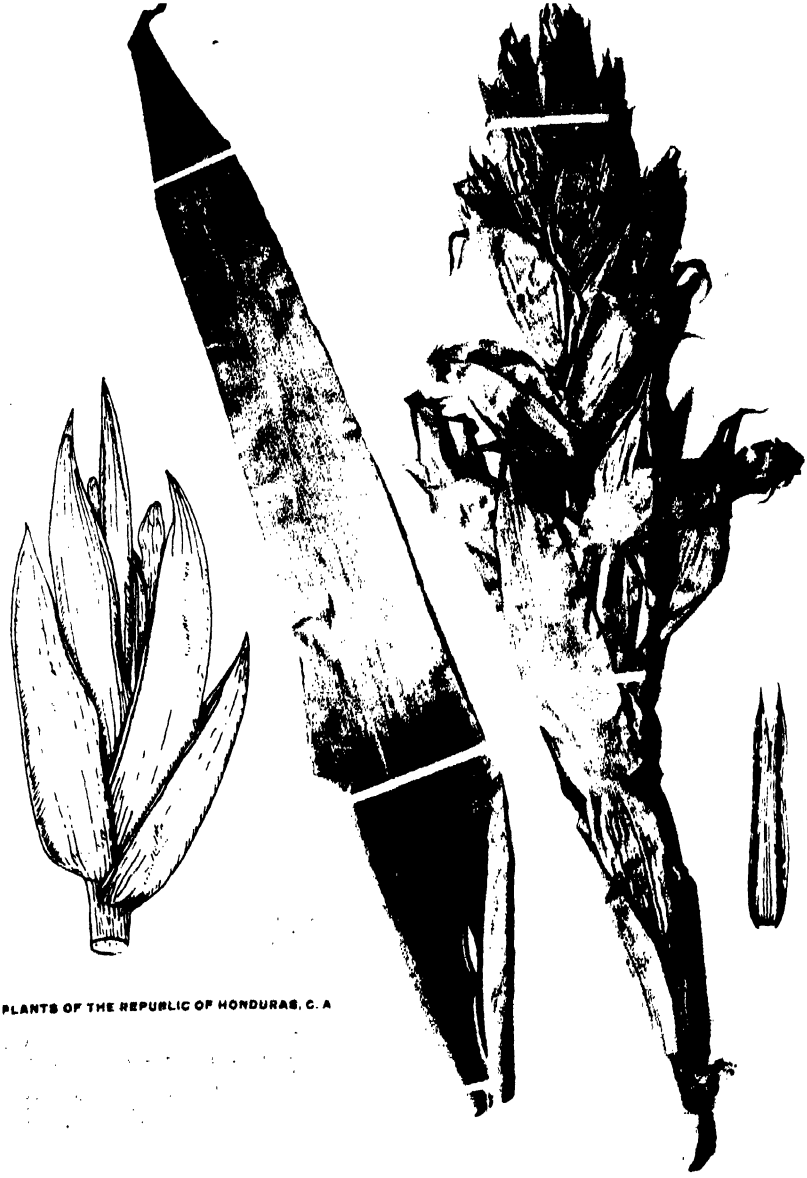
TILLANDSIA GLOSSOPHYLLA L. B. SMITH

Type specimen; one-third natural size; details of flower natural size



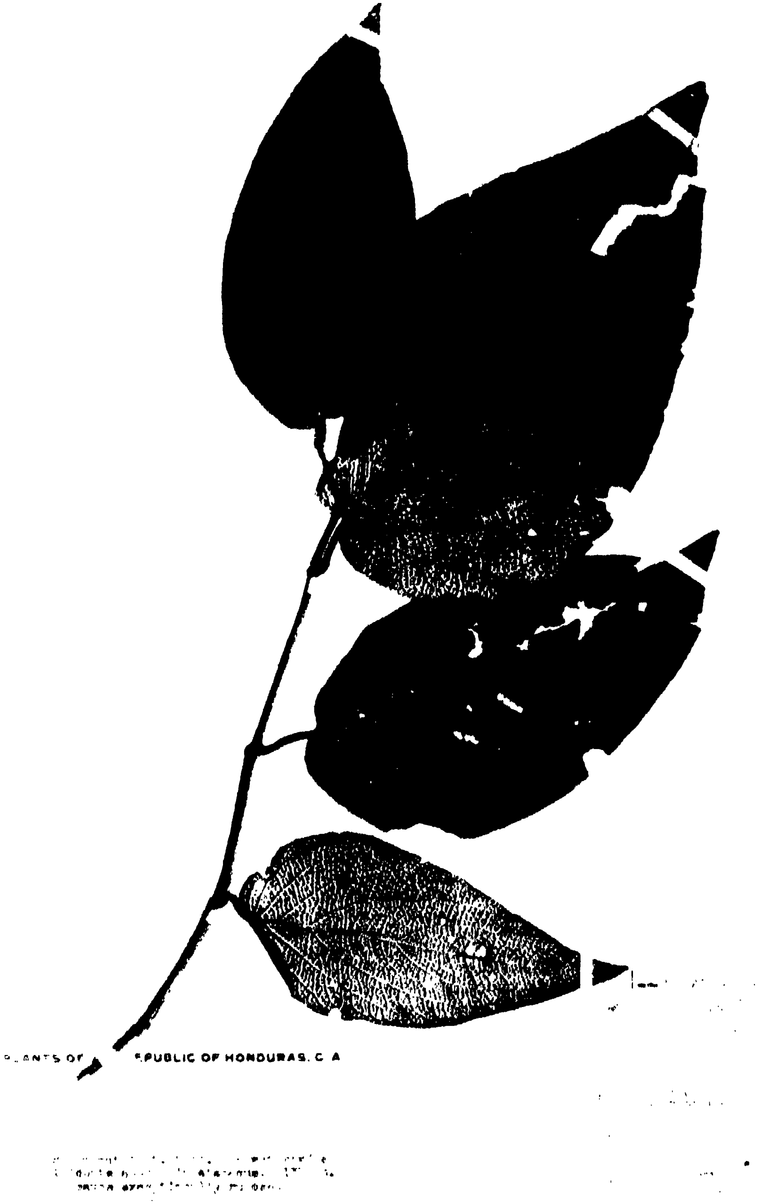
TILLANDSIA LAMPROPODA L. B. SMITH

Type specimen; one-third natural size; details of flower natural size



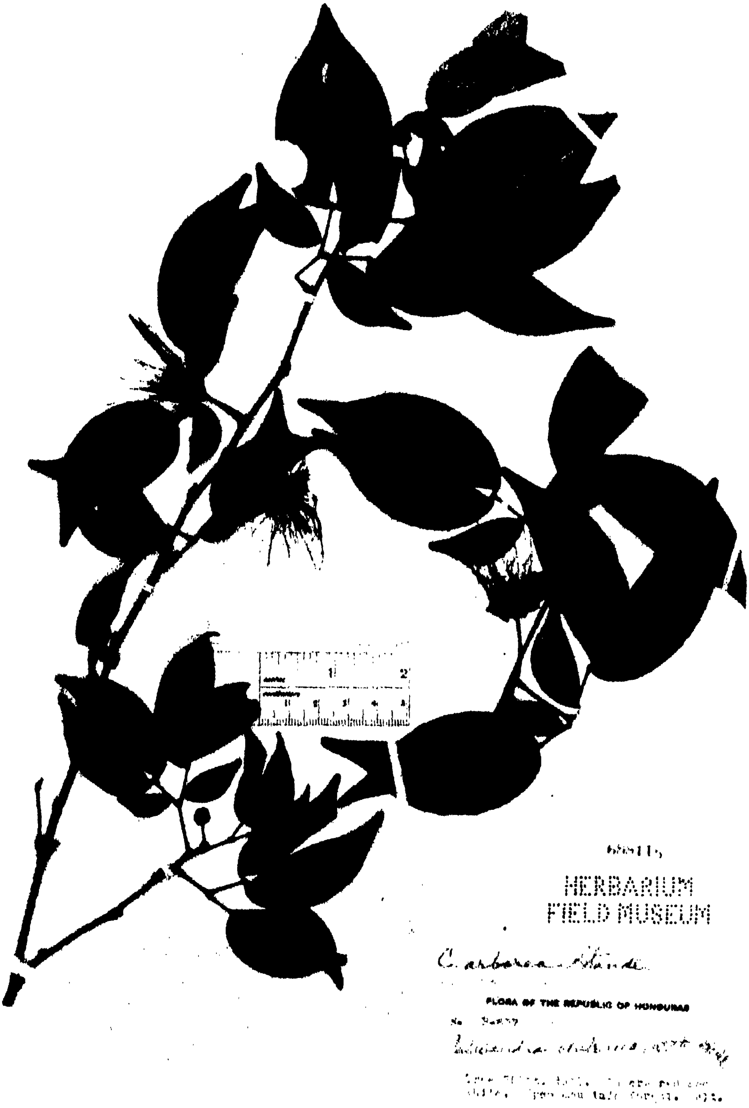
TILLANDSIA YUNCKERI L. B. SMITH

Type specimen; one-third natural size; details of flower natural size

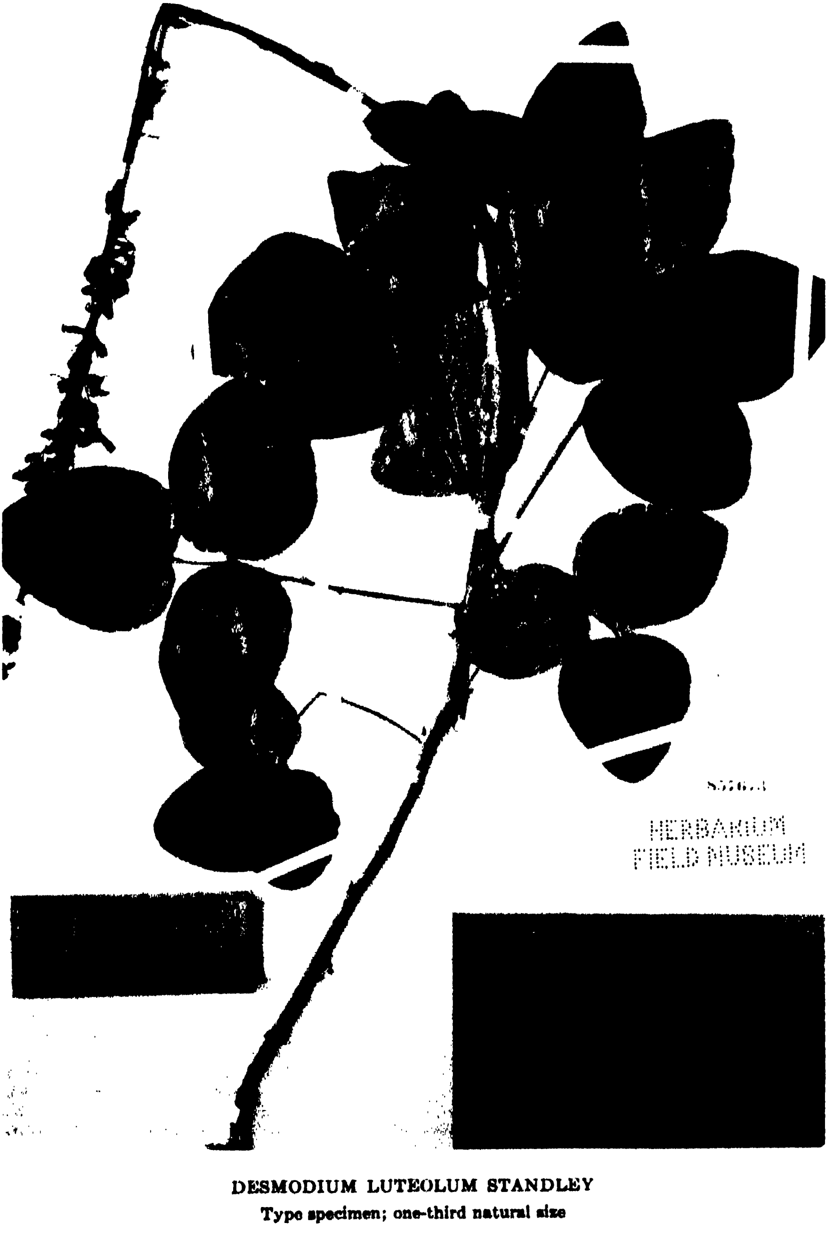


PIPER FAVICULIFERUM TRELEASE

Type specimen; one-third natural size

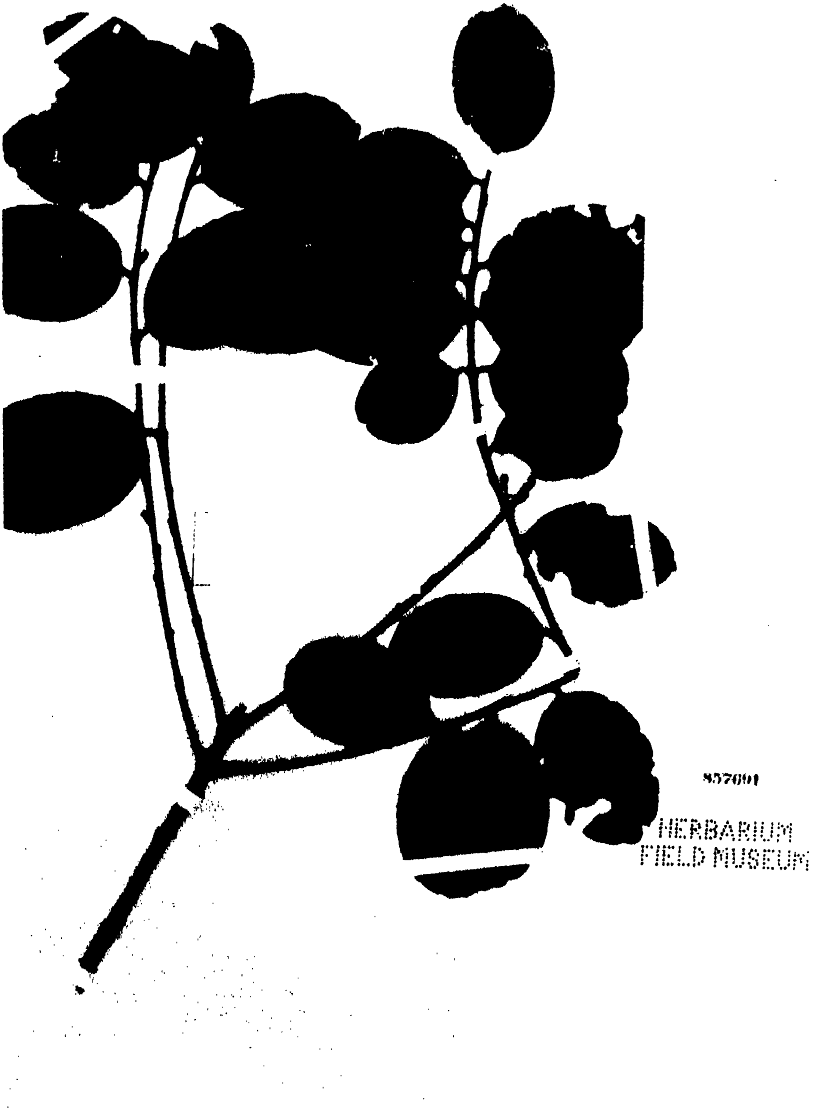


CALLIANDRA ARBOREA STANDLEY
Type specimen; one-third natural size



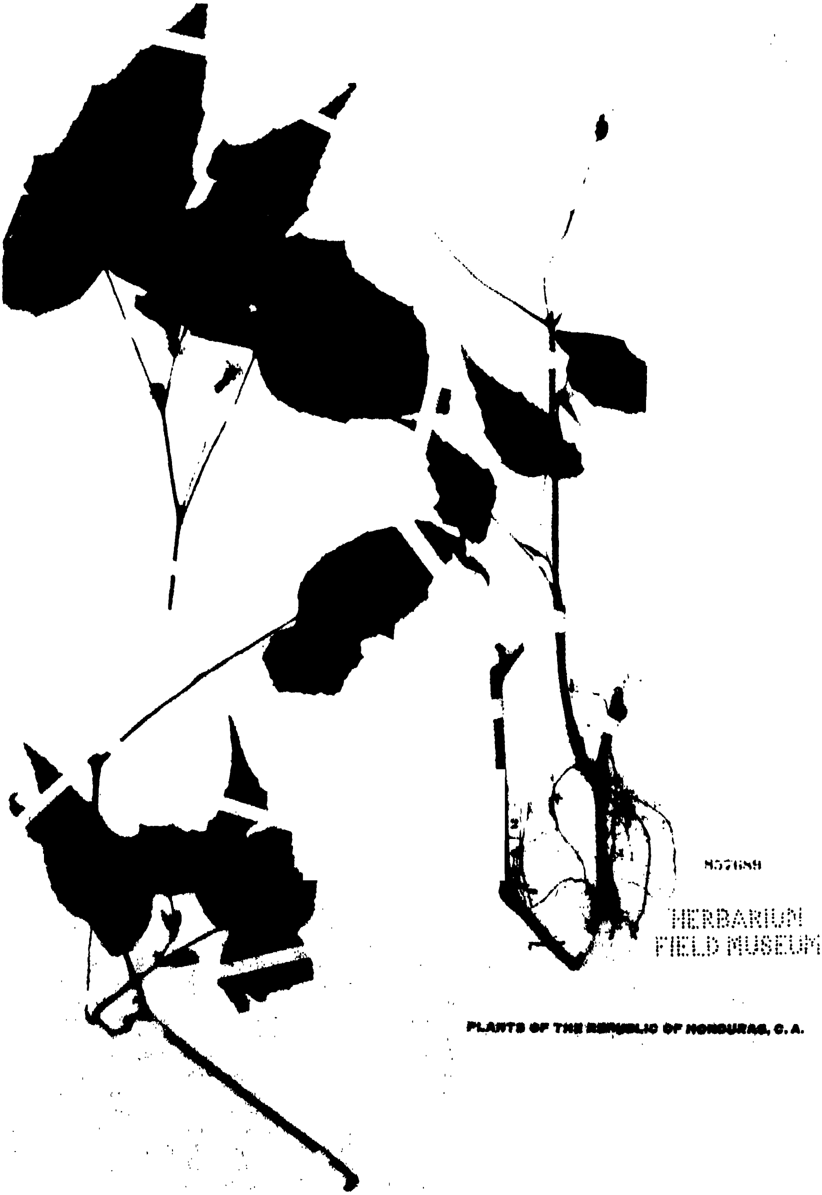
DESMODIUM LUTEOLUM STANDLEY

Type specimen; one-third natural size



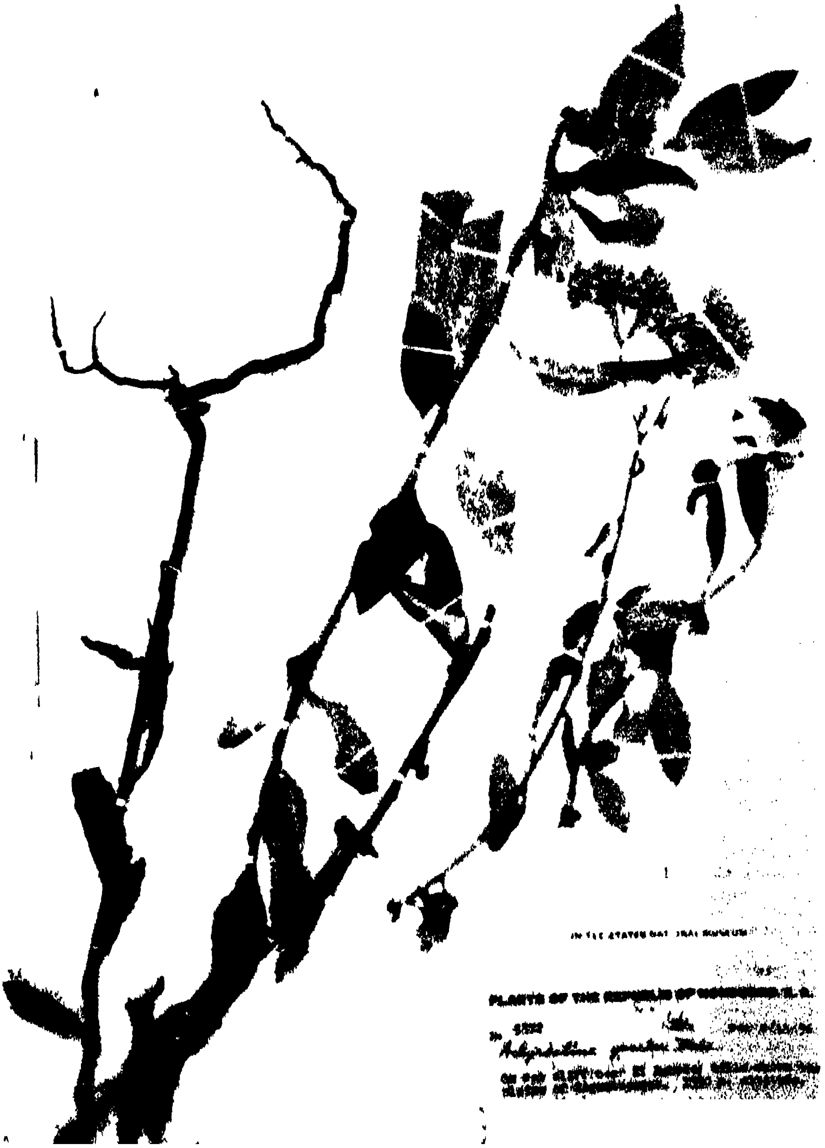
ILEX HONDURENSIS STANDLEY

Type specimen; one-third natural size



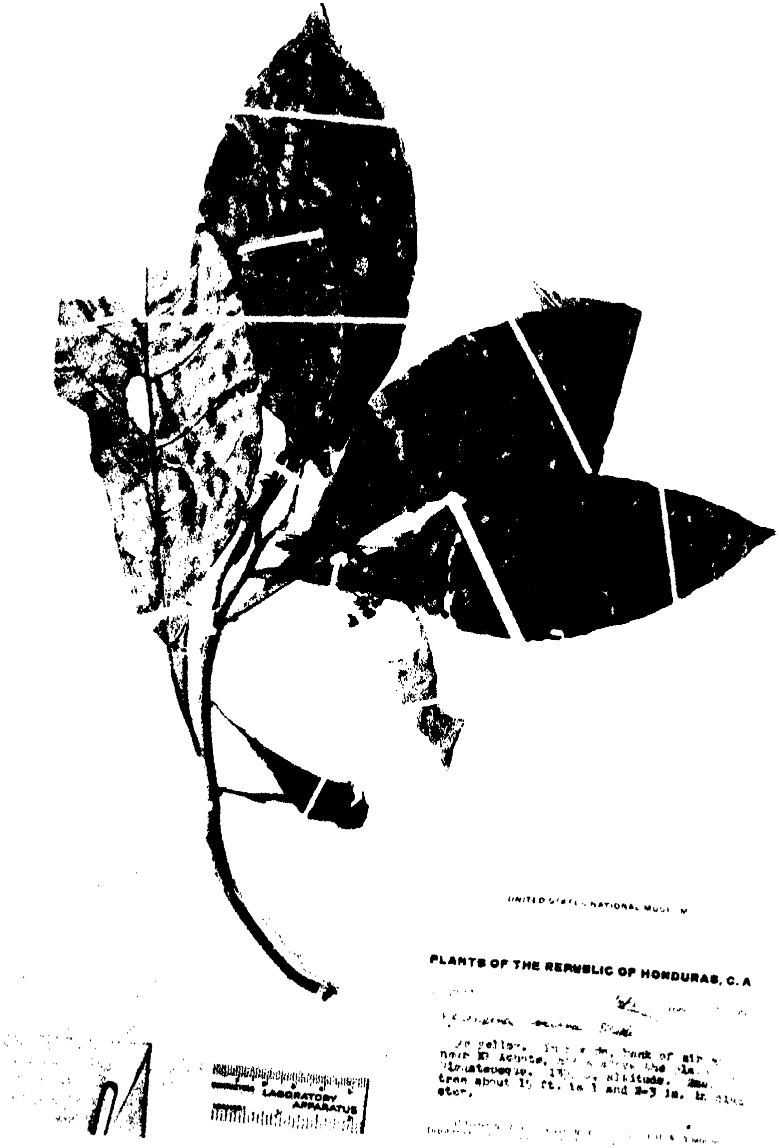
BEGONIA YUNCKERI STANDLEY

Type specimen; one-third natural size



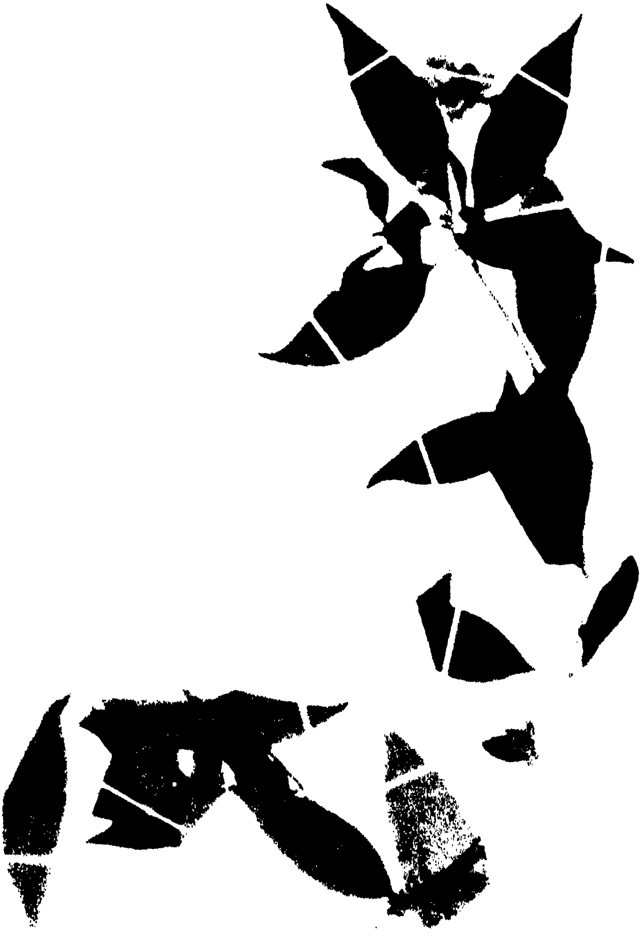
ACHYROCLINE YUNCKERI BLAKE

Type specimen; one-third natural size


UNITED STATES NATIONAL MUSEUM
PLANTS OF THE REPUBLIC OF HONDURAS, C. A
LABORATORY APPARATUS

VERBESINA VICINA BLAKE

Type specimen; one-third natural size



ZEXMENIA PERYMENIOIDES BLAKE

Type specimen; one-third natural size

STUDIES OF THE AMERICAN FLORA—I

BY

JULIAN A. STEYERMARK
ASSISTANT CURATOR OF THE HERBARIUM

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME XVII, NUMBER 5
MAY 27, 1938

PUBLICATION 414

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM

STUDIES OF THE AMERICAN FLORA—I

JULIAN A. STEYERMARK

MORTONIODENDRON, A NEW GENUS OF TILIACEAE

Mortoniodendron Standley & Steyermark, gen. nov. Tiliacearum.—Arbores magnae, pube stellata, ramulis alternis. Folia alterna, subcoriacea, penninervia, integra, subtus parce pube stellata conspersa. Flores cymoso-paniculati, paniculis terminalibus, ramulis minute et dense stellato-tomentellis. Sepala 5, valvata, crasso-subcoriacea, extus dense stellato-tomentosa, intus glabra. Petala valvata, sepalis paullo breviora. Stamina numerosa, omnia fertilia, inaequalia, fasciculata, in phalanges disposita, exterioribus brevissimis, petalis opposita. Antherae 2-loculares, longitrorsum dehiscentes, extrorsae, apice mucronatae. Filamenta brevia, basi libera. Ovarium e calyce liberum, superum, 5-loculare, dense stellato-tomentosum, longitrorsum rugosum, ovulis numerosis, placentis protrusis affixis. Fructus capsula globosa, 5-locularis, rugulosa, basi et apice late rotundata, valvis crassis. Semina in quoque loculo 2–3.

Type species, *Mortoniodendron anisophyllum* (Standley) Standley & Steyermark. Panama.

At the time of its description, it was considered improbable that this Panama tree was properly referable to the genus *Sloanea*. However, no further attention was given it until recently, when Professor Samuel J. Record called attention to the fact that its wood was not that of *Sloanea*. He, in fact, considers the wood referable to the Sterculiaceae, and quite similar to that of the genus *Guazuma*, with which, of course, the tree can not be considered to be closely related.

Mortoniodendron is dedicated to Mr. Conrad V. Morton of the United States National Herbarium, who also has made a preliminary study of the plant. It is a pleasure to be able to give recognition, slight although this may be, to the excellent work that he has done upon Mexican and Central American plants, particularly those of Costa Rica, and in such groups as *Viburnum* and Gesneriaceae.

Mortoniodendron anisophyllum (Standley) Standley & Steyermark, comb. nov. *Sloanea anisophylla* Standley, Field Mus. Bot. 4: 228. 1929.

The conclusion by the authors that this new genus is a member of the Tiliaceae was reached only after long and careful consideration. The combination of stellate pubescence with numerous stamens in definite clusters, with the latter character the first approach to cohesion of filaments to form a staminal tube, is characteristic of the Malvales as defined by Engler and Prantl. The reasons for assigning this genus to the Tiliaceae rather than to the Sterculiaceae, which family was at first suggested, are several. The stamens are all fertile, no staminodia being present as in most sterculiaceous genera. The condition of the stamens being opposite the petals, a situation duplicated by some members of the Sterculiaceae, such as *Theobroma* and allied genera, might be somewhat indicative of a relationship with the latter family were it not for the fact that in such sterculiaceous genera the stamens are either accompanied by staminodia or are few in number. In the Tiliaceae numerous stamens are prevalent and are all fertile, and their grouping into definite clusters or bundles is found in a number of genera, while in the genus *Mollia* of the Tiliaceae some of the stamen clusters may be opposite the petals as well as the sepals. The valvate sepals and petals found in *Mortoniodendron* are further characteristic of some members of the Tiliaceae, whereas in Sterculiaceae, although valvate sepals are the rule, no genus is known with valvate petals. Moreover, the larger flower buds with the thickened sepals covered by a grayish buff tomentum and the occurrence of the flowers in a terminal, cymose panicle are much more easily duplicated in a number of Tiliaceae, such as *Tilia, Mollia, Apeiba,* and *Sloanea,* than in most sterculiaceous genera.

Although *Mortoniodendron* thus shows affinity to the Sterculiaceae, its numerous stamens with no co-existing staminodia would indicate that this genus has not yet approached the degree of staminal cohesion and partial sterilization which characterizes most of the Sterculiaceae. The fact that the numerous fertile stamens occur in definite groups seems to indicate that *Mortoniodendron* has advanced a step toward the sterculiaceous condition, while the fact that its numerous stamens are all fertile establishes its connection with the Tiliaceae. Thus, in respect to its staminal characters, the genus may be said to be a connecting link between the Tiliaceae and the Sterculiaceae.

Explanation of Figure 26.—Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley & Steyermark, with a dissected portion of the flower drawn (×9) to show pistil,

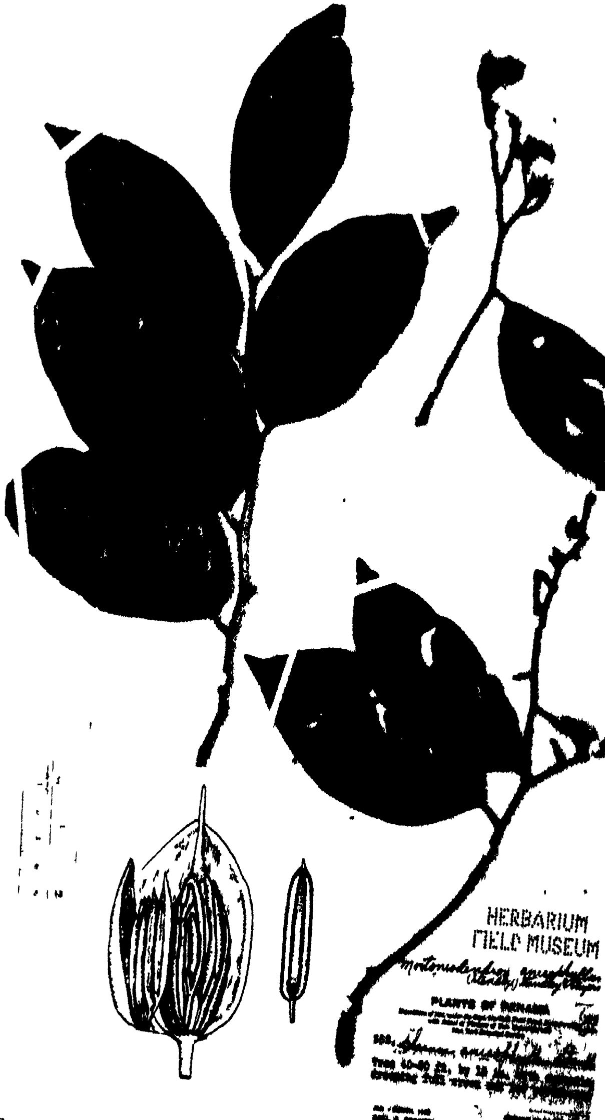


FIG. 26. Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley & Steyermark. Flower drawn to show pistil, stamen cluster opposite petal, and sepal, and a single stamen unattached.

stamen cluster opposite petal, and sepal, and a single stamen unattached.

Explanation of Figure 27.—Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley & Steyermark, showing the fruit.

NEW SOUTH AMERICAN EUPHORBIACEAE

In attempting to determine several South American Euphorbiaceae, a number of novelties have been encountered, of which the following represent a preliminary study.

Conceveiba magnifica Steyermark, sp. nov.—Arbor 25 m. alta; ramulis junioribus pilis minutis stellatis conspersis; petiolo 3–6.5 cm. longo, minute stellato-pubescente, apice obscure glandulari; limbis late ellipticis vel oblongo-ellipticis, 12–22 cm. longis, 7.5–12 cm. latis, apice obtusis, basi obtusis, leviter crenatis, membranaceis, supra viridibus, subtus pallidioribus et prominente reticulatis, costis 12–16, parce et minute stellato-pubescentibus; inflorescentia feminea 6.5–9 cm. longa, simplici, elongata, ramulo robusto, 2–3 mm. crasso, dense pubescente; floribus femineis in pedicellis crassis, glandulis basi magnis nigris 1.5 mm. longis, 1 mm. latis; sepalis femineis lanceolatis, acuminatis, 2.5 mm. longis, extus et basi intus dense tomentosis, basi eglandulosis; ovario ovoideo, dense tomentoso; columna stylari 1–2 mm. longa; ramulis stylaribus crassis, bilobatis, recurvato-patentibus, 3 mm. longis.—Brazil: State of Amazonas, Municipality São Paulo de Olivença, basin of Creek Belem, basin of Rio Solimoes, October 26–December 11, 1936, *Krukoff 8698* (type in New York Botanical Garden herbarium).

Differs from the other species in its very densely tomentose ovary, much larger and membranaceous leaves, and in the lack of glands at the base of the sepals.

Conceveiba Krukoffii Steyermark, sp. nov.—Arbor 15 m. alta, trunco 10 cm. diametro, saltem ramulis junioribus pilis minutis stellatis conspersis; petiolo 1.5–4.5 cm. longo, minute stellato-pubescente, apice indistincte glandulari; limbo oblongo-ovato vel late oblongo-elliptico, obtuse et abrupte caudato-acuminato, apice obtuso, distante et inconspicue dentato, coriaceo, reticulato, supra nitido, concolore, costis et superficie inferiore parce minute stellato-pubescentibus; inflorescentia mascula non visa; sepalis femineis 5 ovato-lanceolatis, acuminatis, 2–2.2 mm. longis, stellato-pubescentibus similiter ut pedicellis; glandulis basi calycis feminei et basi

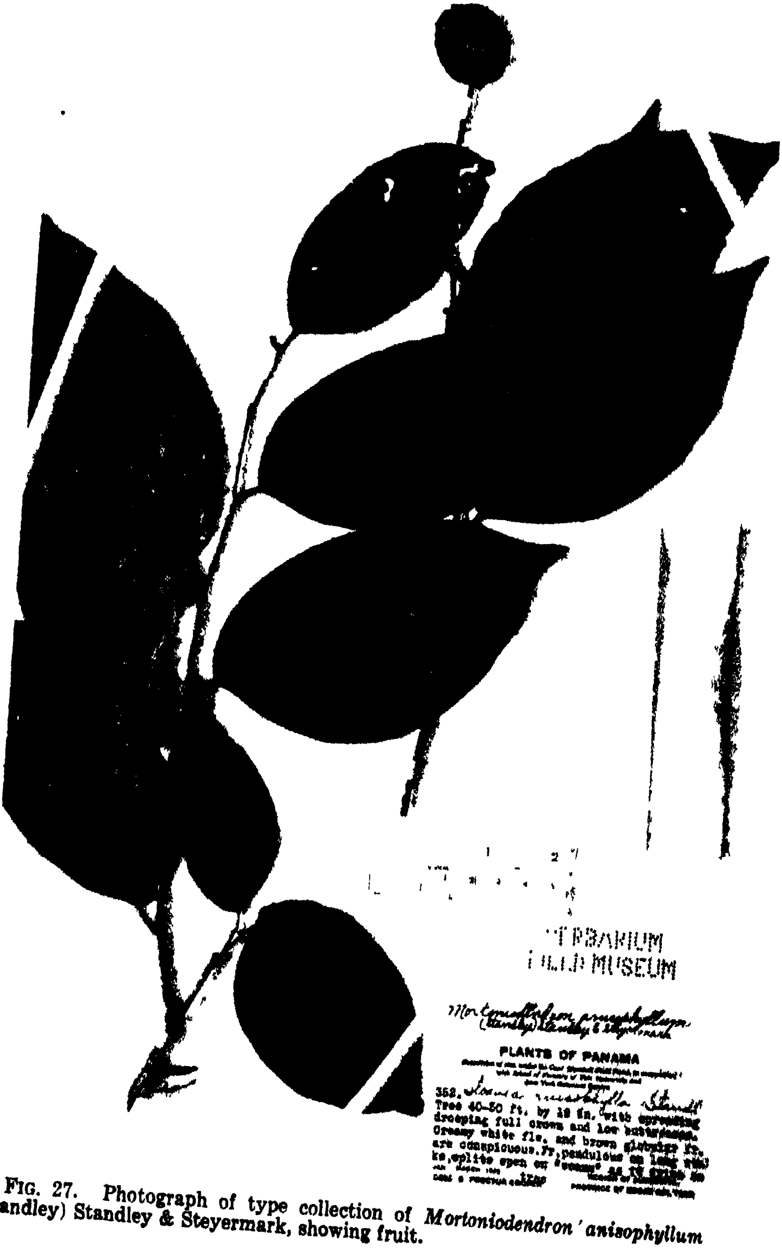

HERBARIUM
FIELD MUSEUM
PLANTS OF PANAMA
352.
Tree 40–50 ft. by 18 in. with spreading
drooping full crown and low buttresses.
Creamy white fls. and brown globular fr.
are conspicuous. Fr. pendulous on long stalks, splits open on "seams"

FIG. 27. Photograph of type collection of *Mortoniodendron anisophyllum* (Standley) Standley & Steyermark, showing fruit.

pedunculi nigris oblongis, 1.5–1.8 mm. longis, ca. 1.5 mm. latis; ovario ovoideo, obtuse trigono, tomentello; stylis inferne in columellas ca. 3 mm. longas connatis, ramulis stylaribus carnosis, bilobatis, recurvato-patentibus, 4–5 mm. longis; capsula (immatura) 1.5 cm. longa, 1.3 cm. lata, obtuse trigona, angulis carinatis, 1.3 cm. lata.—Brazil: State of Amazonas, Municipality São Paulo de Olivença, near Palmares, basin of Rio Solimoes, September 11–October 26, 1936, *Krukoff 8396* (type in New York Botanical Garden herbarium); same locality, on terra firma, high land, *Krukoff 8533* (N. Y. Bot. Gard. herb.).

This species differs from *C. guyanensis* principally in the longer style column, 3 mm. long.

Conceveiba simulata Steyermark, sp. nov.—Arbor 20–25 m. alta, trunco 17 cm. diametro, saltem ramulis et inflorescentiis firmiter et minute stellato-pubescentibus, ramulis vetustioribus mox glabris; petiolo 1–3 cm. longo, tenui, dense minute stellato-pubescente; limbo elliptico-oblongo vel oblongo, 7–12 cm. longo, 2.5–5 cm. lato, obscure et distante serrulato, apice caudato-acuminato, basi obtuso vel acutiusculo, supra laevi et nitido, subtus minute et parce stellato-pubescente, costis eminentibus et ad marginem adscendentibus, reticulato, concolore; inflorescentia mascula late pyramidali, stellato-pubescente; inflorescentia feminea non visa; calyce masculo 3–4-partito, lobis ovatis, acutis, glabris; staminibus exterioribus plerumque 9, interioribus sterilibus, plerumque 9–10, flexuosis, exteriores excedentibus, filamentis latis—Brazil: Terra firma, high forest, State of Amazonas, Municipality São Paulo de Olivença, basin of Creek Belem, basin of Rio Solimoes, October 26–December 11, 1936, *Krukoff 8616* (type in New York Botanical Garden herbarium); same locality and date, *Krukoff 8609* (N. Y. Bot. Gard. herb.).

This species is similar to *C. guyanensis*, from which it differs in its much shorter staminate inflorescence, and in possessing a greater number of fertile and sterile stamens, usually 9 fertile and 9–10 sterile.

Mabea Klugii Steyermark, sp. nov.—Arbor 6 m. alta; ramulis inferne glabris, superne furfuraceo-pubescentibus; petiolo 0.4–0.6 cm. longo, cano-furfuraceo, puberulento; foliis oblongo-lanceolatis, 7–14 cm. longis, 2–3.8 cm. latis, basi rotundatis, apice abrupte caudatis, coriaceis, supra laevibus nitidisque, subtus furfuraceis, costa media et basi limbi densius furfuraceis, minute cano-puberulentis vel fuscis, subtus pallidis et glaucescentibus, subintegris vel minute crenulatodenticulatis, costis 15–20 paribus, divaricate patentibus; stipulis conspicuis, in ramulis florescentibus persistentibus, lineari-lanceolatis, setaceis, 1.7–1.9 cm. longis, furfuraceis; paniculis 1.8 dm. longis, in parte mascula 2.5 cm. latis, in parte feminea 3 cm. latis, axe dense furfuraceo-tomentoso; pedicellis masculis umbelliformibus, cinereo-puberulentis, 1.2–1.4 cm. longis, basi firmiter valde biglandulosis, glandulis nigris, oblongis, 2 mm. longis, 1 mm. latis; sepalis masculis apice rotundatis, firmiter cinereo-puberulentis; staminibus 25–30; antheris subsessilibus; bracteis stamina subtendentibus ovatis 4–5 mm. longis, acuminatis; sepalis femineis cum 3 sepalis exterioribus magnis 4.5–6 mm. longis, 3 sepalis interioribus leviter longioribus, 5.5–6.5 mm. longis, ovatis, valde acuminatis, intus dense glandularibus, extus firmiter cinereo-puberulentis, bracteis subtendentibus conspicuis, ovatis, acuminatis, 0.8–1 cm. longis, 3–4 mm. latis; columna stylari 0.8–1 cm. longa, ramulis liberis 6–7 mm. longis.—Colombia: Forest, Comisaria del Putumayo, Umbria, 0° 54′ N., 76° 10′ W., alt. 325 meters, January–February, 1931, *Klug 1969* (type in the Herbarium of Field Museum).

This is the second species of the section *Intermediae* to be known, both species of the section being thus far limited to Colombia. The only character common to both the members of this section (*M. Klugii* and *M. Trianae*) is the glandular inner surface of the pistillate sepals. *Mabea Klugii* is at once distinguished from *M. Trianae* by its much larger pistillate bracts and sepals, by the occurrence of glands at the base of the much longer staminate pedicels, and by the peculiar pubescence, especially on the lower surface of the leaves.

In general habit it combines characters found in several species of section *Umbelluliferae*. It is related in appearance to *M. Taquari* but differs from this species in the basal glands, the longer panicles, and longer pistillate bracts and sepals; it differs from *M. Piriri* in similar characters and in pubescence, and from *M. fistuligera* it differs in having a less ferruginous pubescence and an umbelluliform inflorescence.

Mabea Standleyi Steyermark, sp. nov.—Frutex 2 m. altus; ramulis glabris, olivaceo-fuscis; petiolo 0.8–1 cm. longo; foliis oblongis vel elliptico-oblongis, 12–20 cm. longis, 5.5–6.5 cm. latis, subintegris, apice abrupte caudatis, basi obtusis, omnino glabris, concoloribus, subtus fuscis, costis subtus conspicuis arcuato-ascendentibus cum 11–12 paribus 1–1.5 cm. distantibus, ante margines extendentibus cum arcis magnis conjungentibus; stipulis conspicuis in ramulis florescentibus persistentibus, lineari-setaceis, 1–1.2 cm. longis; paniculis 11 cm. longis, 2.5 cm. latis, axe firmiter cinereo-puberulente, pedicellis masculis 1–1.3 cm. longis, firmiter cinereo-puberulentis, basi juxta axem valde biglandulosis, glandulis nigris, globosis, 2–2.3 mm. longis; sepalis masculis apice rotundatis, purpureo-puberulentis, late rotundatis; staminibus 60–65, breviter stipitatis; sepalis femineis 2.5–3.5 mm. longis, purpureo-puberulentis, ovatis, acuminatis, intus eglandulosis; columna stylari 1.8–2 cm. longa, cinereo-puberulenta; stylis recurvatis 6 mm. longis.—Peru: Dept. Loreto, Florida, forest, Río Putumayo, at mouth of Río Zubineta, alt. 200 meters, March–April, 1931, *Klug 2064* (type in Herbarium of Field Museum).

This new species adds another member to the section *Umbelluliferae*. The number of stamens (60–65) and narrowly oblong panicles relate *M. Standleyi* to *M. speciosa*, from which species and from all other species of this section it is distinguished by its suborbicular glands being directly next to the rachis at the very base of each staminate branch of the panicle.

Mabea elata Steyermark, sp. nov.—Arbor 10 m. alta, ramulis furfuraceo-fuscis; foliis oblongis, apice abrupte caudato-acuminatis, basi obtusis, 8.5–11.5 cm. longis, 2.5–4.5 cm. latis, subintegris, subcoriaceis, supra in costa media et prope apicem furfuraceo-puberulentis, in superficie inferiore tota pube fusco-cana puberulentis, subtus fuscis; costis 15–17 paribus, in superficie inferiore non prominentibus nec ante margines conspicue confluentibus; stipulis absentibus; paniculis 11.5–16 cm. longis, 4–5.5 cm. latis, axe firmiter pallido-fusco pubescente; pedicellis masculis in racemis umbelluliformibus, 1.5 cm. longis, 2–3 mm. supra basim biglandulosis, glandulis nigris, pube fusca conspersis, magnis, 3–4 mm. longis, 2 mm. latis, dense cinereo-puberulentis; pedicellis masculis conspicue bracteatis, bracteis ovatis, acuminatis, 4–5 mm. longis, 2.5 mm. latis; sepalis masculis apice rotundatis, cinereo-puberulentis; staminibus 50–60; sepalis femineis 4.5–6 mm. longis, interioribus longioribus quam exterioribus, acuminatis, ovatis, pallido-fusco-cinereo-puberulentis, infra nigris et intus dense cinereo-glandularibus; columna stylari 8 mm. longa, fusco-tomentosa; stylis 1.2 cm. longis.—Peru: Dept. Loreto, forest, between Balsapuerto and Moyobamba, alt. 600–1,200 meters, August–September, 1933, *Klug 3206* (type in Herbarium of Field Museum).

The glandular inner portion of the pistillate sepals allies this species to the section *Intermediae*, it being the first of this section from Peru. In appearance the plant simulates some species of

section *Umbelluliferae* having numerous stamens, i.e., *M. caudata*, *M. speciosa*, and *M. pulcherrima*.

Mabea Piririoides Steyermark, sp. nov.—Arbor 12 m. alta omnino glabra; petiolo 6–7 mm. longo; foliis oblongo-lanceolatis vel elliptico-lanceolatis, basi acutis, apice abrupte acuminatis, 4–5.5 cm. longis, 1–2 cm. latis, concoloribus, firme membranaceis vel subcoriaceis, glabris, obscure crenulato-serrulatis, costis 8–10 paribus divaricato-adscendentibus, subtus prominentibus; axe et pedunculis fere omnino glabris, fuscis; paniculis 5–6 cm. longis, 1.5–2 cm. latis, pedicellis masculis cano-tomentulosis, 2.5–5 mm. longis; glandulis supra basim minutis, subglobosis vel oblongis, fusco-nigris; staminibus 27–33; antheris oblongis, sessilibus; pedicellis femineis cano-tomentulosis; sepalis femineis 6, 2 mm. longis, ovatis, acutis, cano-tomentulosis, intus eglandulosis; columna stylari ca. 1 cm. longa, ramulis liberis 4–5 mm. longis.—Brazil: Terra firma, Campo de Boa Esperança, State of Maranhão, Maracassumé River region, October 24, 1932, *Krukoff 1983* (type in Herbarium of Field Museum).

This new species is a member of the section *Umbelluliferae*, and is most closely related to *M. Piriri*, although also related to *M. parvifolia* and *M. subserrulata*. In several respects it may be distinguished. The glands on the staminate pedicels are smaller and less conspicuous, and are brownish black, not as dark as in *M. Piriri* or *M. parvifolia*. In *M. parvifolia* the leaves are obtuse at the base, whereas in *M. Piririoides* they are acute. In the new species the leaves on the lower surface are not grayish blue as they are in both *M. parvifolia* and *M. Piriri*, nor are they finely reticulated as in *M. parvifolia*. The leaves of *M. Piririoides* are shorter, more coriaceous, and less serrulate than in *M. Piriri* and smaller than in *M. subserrulata*. Finally, the style column in *M. Piririoides* is longer than in *M. parvifolia*.

Richeria submembranacea Steyermark, sp. nov.—Arbor 17 m. alta, trunco 12 cm. diametro, ramulis glabris; petiolo 0.5–1.2 cm. longo, minute strigilloso vel glabro; foliis obovato-ellipticis, 7.5–11.5 cm. longis, 3.5–5.5 cm. latis, supra glabris et obscuris, subtus glabris, concoloribus, integris, basi acutis, apice abrupte caudatis, membranaceis vel submembranaceis, costis 6–8 paribus; inflorescentiis masculis tenuibus, 9–11 cm. longis, dense pallido-fusco-hirtellis; floribus masculis in pedunculis brevibus 1.5 mm. latis, sepalis 5, late ovatis, obtusis, extus paullo hirtellis; staminibus 5, antheris introrsis, glandulis 5 alternantibus; inflorescentia feminea non visa.—Brazil: State of Amazonas, Municipality São Paulo de Olivença, near Palmares, basin of Rio Solimoes, September 11–October 26, 1936, *Krukoff 8513* (type in New York Botanical Garden herbarium).

This new species of *Richeria* differs from all the others in its submembranaceous leaves. From *R. grandis* it may be distinguished by its pedunculate staminate flowers, while from *R. laurifolia* it at once differs in its thin, entire, abruptly caudate leaves. The male flowers are smaller than in *R. obovata* and the inflorescence and leaves are shorter than in *R. racemosa.*

Drypetes amazonica Steyermark, sp. nov.—Frutex 6–11 m. altus; ramulis glabris cinereis; foliis subcoriaceis, ellipticis, basi acutis apice sensim acuminatis, integris, 12–24 cm. longis, 3–7 cm. latis, per omnes partes glabris, concoloribus; petiolo 0.4–1 cm. longo, glabro; floribus masculis 7–numerosis in axillis foliorum fasciculatis, pedicellis 3–4 mm. longis, tenuibus, sepalis 4, subrotundatis, extus sparse strigillosis, margine minute ciliatis, 2.6–2.9 mm. longis, 2.1–2.3 mm. latis; staminibus 8–10, discum centralem cingentibus; ovarii rudimento nullo; floribus femineis 1–3 in axillis foliorum, sepalis 5, rotundatis, 3–3.5 mm. longis, 2.2 mm. latis, extus pilosulis, rubris; fructu drupaceo, pyriforme, tomentoso, immaturo 1.5–1.7 cm. longo.—Brazil: Amazonas, on varzea land, basin of Rio Madeira, Municipality Humayta, near Tres Casas, September 14–October 11, 1934, *B. A. Krukoff 6210* (type in New York Botanical Garden herbarium; fragment in Herbarium of Field Museum); same locality and date, *Krukoff 6176* (New York Botanical Garden herbarium); same locality and date, *Krukoff 6196* (Herbarium of Field Museum); Amazonas, on terra firma, basin of Rio Madeira, Municipality Humayta, near Livramento, on Rio Livramento, October 12–November 6, 1934, *Krukoff 6630* (New York Botanical Garden herbarium); same locality and date, *Krukoff 6711, 6734* (New York Botanical Garden herbarium).

This new species of *Drypetes* belongs to the section *Hemicyclia* (Wight & Arn.) Pax & K. Hoffm. It is related to *D. variabilis* Uitt., from which it differs in the 7–many-flowered instead of 1–3-flowered staminate fascicles, in the number of stamens, which are 8–10, rather than 4–7, and in the greater leaf length and long-acuminate apex. It is also related to the West Indian *D. keyensis*, from which it differs in leaf shape and apex, much larger number of staminate-flowered fascicles with longer filaments, and 4 instead of 5 staminate sepals, and to the West Indian *D. Picardae*, which has a different leaf shape and apex.

A NEW BRAZILIAN SPECIES OF MENDONCIA

Mendoncia Mello-Barretoana Steyermark, sp. nov.—Planta volubilis, caulibus teretibus, sulcatis, pilis patentibus flavidis hirsutis; foliis late ovatis vel elliptico-ovatis, apice abrupte cuspidato-acuminatis, basi rotundatis vel acutis, 7–11 cm. longis, 4–7.5 cm. latis, pagina superiore dense pubescentibus, pilis brevibus basi strumosa nascentibus, pagina inferiore dense molliterque flavido-pubescentibus; petiolo 1.7–3 cm. longo, dense pilis patentibus flavidis pubescente; bracteolis oblongo-ovatis, apice rotundatis mucronatis, mucrone fere 2 mm. longo, 2.5 cm. longis, 1.7–2 cm. latis, pilis brevibus patentibus flavidis pubescentibus, 0.5–0.8 mm. longis; pedicellis 4–5 cm. longis, dense pilis patentibus pubescentibus; calyce cupulare, 2.5–3 mm. longo, dense adpresso-pubescente; corolla infundibuliformi, extus glabra, fere 4.5 cm. longa, tubo fere 2.2 cm. longo, basi 0.6 cm. diametro, alba, fauce cum rubro lineato; ovario 5 mm. alto, dense flavido-hispidulo; stylo 2.3 cm. longo, inferne leviter puberulo, superne glabro.—Brazil: Suyo, Jardim Botanico, Municipio Bello Horizonte, Minas Geraes, December 1, 1934, *H. L. Mello Barreto 226* (type in Herbarium of Field Museum).

This new species of *Mendoncia* is characterized by its dense, short, spreading, yellowish brown pubescence on all parts, large, infundibuliform corolla 4.5 cm. long, whose throat is striped with reddish, and densely hispidulous, cupuliform calyx. This last character separates it at once from the related *M. albida*, *M. puberula*, and *M. hirsuta*. From the Peruvian *M. Killipii* it is distinguished by its much larger and differently colored corolla.

A NEW VIGUIERA FROM MEXICO

Viguiera Shrevei Steyermark, sp. nov.—Herbacea erecta, superne ramosa, caule valido per omnes partes praeter partes supremas fere glabro; foliis fere oppositis superne interdum alternis anguste lanceolatis acutis distante et obscure denticulatis sessilibus penninerviis, supra viridibus et minute tuberculato-hispidulis, infra pallidis et dense canescenti-hispidulis, 7–14 cm. longis, 0.8–2 cm. latis, membranaceis; pedunculis pluribus, nudis, monocephalis, cano-hirtellis, 8 cm. longis; capitulis majusculis, ca. 5 cm. latis luteis homochromis; disco 1.2 cm. alto, 1.7 cm. lato, involucro 2–3-seriato, bracteis exterioribus foliaceis discum excedentibus lanceolatis acutis 19–27 mm. longis, 3–5 mm.

latis, 1-nervatis, canescenti-hirtellis, herbaceis; radiis speciosis 15–18, oblongo-obovatis, apice rotundatis tridentatis 2–2.2 cm. longis, 10 cm. latis; pappo nullo; achaenio glabro.—Mexico: Chihuahua, stream bank near San Juanito, District of Bocoyna, alt. 2,400 meters, July 26, 1937, *Forrest Shreve 8035* (type in Herbarium of Field Museum).

It is a pleasure to dedicate this new species to Dr. Forrest Shreve, who has contributed such valuable studies on the flora of the southwestern United States and adjacent Mexico.

Viguiera Shrevei, with its herbaceous, 2–3-seriate involucre and epappose achene, is obviously a member of the section *Heliomeris* (Nutt.) Blake. It appears most closely related to *V. multiflora* (Nutt.) Blake, var. *genuina* Blake, from which it differs in its much stouter and mostly glabrous stems which are canescent only at the top and on the peduncles, larger leaves and heads, longer and broader rays, and conspicuously foliaceous involucral bracts.

ANOTHER NEW SPECIES OF SELENIA FROM TEXAS

Selenia oinosepala Steyermark, sp. nov.—Herba acaulis vel caulescens annua hiemans glabra; foliis pinnatim dissectis, divisuris primariis et secondariis pinnatifidis, segmentis ultimis oblongis vel obovatis apice obtusis; sepalis roseo-purpureis vel vinaceis, 8–9 mm. longis, oblongo-lanceolatis, caudatis; petalis luteis, 10–11 mm. longis; stylo 3 mm. longo; siliquis immaturis; seminibus orbicularibus alatis.—Texas: San Benito, February 28, 1930, *Eula Whitehouse* (type in herbarium of the University of Texas; fragment in Herb. Field Mus.); San Benito, February–April, 1931, *Mrs. Paul Cottrell* (herbarium of the University of Texas).

This new species is the sixth one of the genus to be described, the most recently published ones being *S. mexicana* Standley,[1] *S. Jonesii* Cory,[2] and *S. grandis* Martin[3] (see p. 443). From all species of the genus *S. oinosepala* differs in its remarkable rose- or pink-purplish sepals of delicate, petaloid texture. In habit, cut of foliage, caudate sepals, and length of style it resembles and is most closely related to *S. dissecta* Torr. & Gray. Besides the colored sepals, *S. oinosepala* differs from *S. dissecta* in its smaller petals, 10–11 mm. long instead of 13–15 mm. as in *S. dissecta*, and in its obtuse rather than

---

[1] P. C. Standley. Studies of American Plants. Field Mus. Bot. 17: 191. 1937.

[2] V. I. Cory. A New Selenia from the Edwards Plateau of Texas. Rhodora 33: 142. 1931.

[3] R. F. Martin. A New Selenia from Texas. Rhodora 40: 183. 1938.

acute or acutish ultimate leaf segments. From *S. mexicana* Standley and *S. Jonesii* Cory it differs in its entirely distinctive foliage and larger flowers.

Selenia oinosepala has been collected thus far only in the region of San Benito, Cameron County, in the extreme southeastern corner of Texas. This portion of the Gulf Coast has a number of other interesting isolated species, among which may be mentioned *Grindelia oolepis* Blake.

GROSS MORPHOLOGY OF THE GENUS GRINDELIA

This paper concludes the monographic treatment of the genus *Grindelia* which was started in 1931, and is a part of the series of "Studies in Grindelia I, II, and III" published respectively in volumes 21 and 24 of the *Annals of the Missouri Botanical Garden.* Monographic studies are now in progress on the genera *Chrysopsis, Gutierrezia,* and *Liatris.*

HABIT

The genus *Grindelia* comprises annuals, biennials, and perennials. Some of the Mexican and Texan species are annuals, whereas most, if not all, the Californian species are perennials. The perennial habit is particularly evident in the Pacific coastal species, many of which frequent salt marshes and tidal estuaries. Species, like *G. lanceolata* and *G. squarrosa,* may be both biennial and perennial.

Most of the biennials in *Grindelia* produce a many-leafed rosette the first season and flower the next. *Grindelia lanceolata* and *G. squarrosa* well illustrate two different types of biennials. *Grindelia lanceolata,* a late-flowering species, from July to early November, matures its seeds late in autumn, and during the ensuing winter the seeds fall to the ground. The following spring, germination normally occurs and the rosette of leaves which forms carries the plant over until the following spring when the second season's growth, with flowering stems, occurs. This species is normally a biennial, dying at the close of the second season. Sometimes, however, a basal rosette of leaves remains attached to the stem, endures the winter, and the plant flowers a third or fourth season or sometimes longer, as sometimes occurs when plants growing along railroad tracks are cut close to the ground and the roots are thereby stimulated to perennate. The same process of cutting the flowering stems close to the ground will stimulate *G. squarrosa* to act as a perennial. This last species, usually a biennial, blooms earlier than *G. lanceolata,* commonly June–August, ripens its seeds in late summer, and germination mostly takes place the same season, in early or late autumn. These seedling plants produce a few leaves which tide the plant over the winter, and the following spring and summer more rosette leaves are produced, which endure the succeeding winter. Then, the next year the first flowering stems are produced.

ROOTS

The root system in all cases is that of a tap root rarely extending more than 6 decimeters below the surface of the ground. The perennial and often some biennial species develop a semi-ligneous root, which becomes more and more lignescent with age. The tap root is usually vertical, but sometimes develops curvatures when the plant occurs in rocky or gravelly soil or on steep hillsides or in other habitats where obstructing masses may prevent a normal vertical growth.

STEMS

The plants are all caulescent, but the stems may vary from such dwarf types as *G. microcephala* var. *pusilla* and *G. squarrosa* f. *depressa,* only a few centimeters tall, to very tall plants, like *G. camporum* and *G. procera,* the latter commonly reaching a height of 2–3 meters. In the majority of the species the stems are herbaceous, arising directly from the crown at the surface, or the crown may produce short, simple or branched basal caudices which remain above ground, become semi-ligneous in age, and in turn give rise to herbaceous stems of the season. These herbaceous stems die down at the close of each growing season. A number of species, such as *G. humilis, G. Blakei, G. arenicola* and *G. stricta* var. *Hendersoni,* but only those inhabiting salt marshes, tidal estuaries, coastal and sand dunes or beaches, and similar habitats, are suffrutescent or even suffruticose. In *G. arenicola* and *G. stricta* var. *Hendersoni* the basal portion of the stem is ligneous, the ligneous portion is comparatively slender and attains at most a length of 2–3 decimeters, whereas in *G. humilis,* especially in older plants, the ligneous portions may be very conspicuous and occupy over half the length of the entire plant, the woody cylinder attaining a length up to a meter or so and a surprising thickness of 6 centimeters. These aerial ligneous stems are perennial and remain above ground throughout the duration of the life of the plant, giving rise each season usually from the upper portions to herbaceous or semi-herbaceous stems of the growing season. This development of persistent, aerial, suffruticose stems in these littoral species seems to be directly correlated with the environmental conditions of such habitats.

The stems are simple and monocephalous in the South American *G. globularifolia* and *G. chiloensis*, and in the Mexican *G. inuloides* var. *glandulosa*. The other North American species are practically always branched, the heads being arranged on mostly corymbosely to paniculately branched, floriferous branchlets. The stems are mostly terete and without prominent striations or grooves. In *G. stricta* the stems may be slightly flattened and oval or elliptic in cross section. Some species, like *G. integrifolia* and *G. Howellii*, have deeply grooved or furrowed stems, especially in the upper portions. The stems may be entirely glabrous or strongly villous or sublanuginose. The hairs are multicellular and often slender, weak, and crooked. Often the pubescence, when present, is confined toward the heads, as in *G. stricta*, or various species may be pubescent throughout in the early stages of growth and in age become glabrous below. In the case of species which develop pubescence on the stems, a short, glandular, multicellular puberulence often occurs, especially near the heads. In addition to the glandular hairs being mixed with the non-glandular hairs, the stems of certain species, like *G. inuloides* var. *glandulosa*, may become almost predominantly glandular.

Erect or ascending stems are the general rule in the genus. In *G. stricta* var. *procumbens* the stems are procumbent, widely and almost horizontally spreading. *Grindelia arenicola* and var. *pachyphylla* often develop procumbent stems from the suffrutescent basal axes.

LEAVES

The leaves in the same species are tremendously variable in outline and margin but at the same time very characteristic, and often serve as taxonomic criteria, at least in part, in the matter of the differentiation of the various entities. The radical and lower cauline leaves may be conspicuously pinnatifid, lyrate, laciniate, or incised-dentate. As the middle cauline leaves are approached, the pinnatifid or laciniate condition becomes less marked, the divisions become reduced and more crowded, and with the gradual reduction in size of the upper cauline leaves and those on the floriferous branchlets the margin becomes more regularly serrate, dentate, or crenulate. Such a series of changes is to be noted in *G. squarrosa* var. *nuda*, *G. grandiflora*, *G. texana*, and *G. microcephala* var. *adenodonta*.

In some of the South American species, like *G. chiloensis* and *G. globularifolia*, the stems are more leafy near the base, whereas in most of the North American species this condition does not exist, the leaves being more or less scattered on the stem from base to apex; only in some Mexican species, like *G. inuloides* and *G. inuloides* var. *glandulosa,* which often have very reduced leaves in the upper portion of the stem, is there any suggestion of a condition such as exists in the South American species mentioned.

The leaves are always alternate, and all, except the basal and lowermost cauline, which are mostly petiolate, are sessile. The main cauline leaves may be conspicuously narrowed below the middle to the base, as in *G. nana, G. subalpina,* and *G. stricta,* or they may be strongly ampliated and amplexicaul or subcordate as in *G. rubricaulis* var. *latifolia* and *G. rubricaulis* var. *robusta.* The middle and upper cauline leaves of many of the species are amplexicaul or subamplexicaul.

The shape of the leaves varies considerably even on the same plant. The basal and lowermost are usually attenuate into a petiole-like base, making the leaf spatulate to obovate. As the middle and upper cauline leaves are approached, the basal portion tends to become broader and less attenuated, and when the uppermost cauline leaves and those on the floriferous branchlets are reached, the basal portion in the majority of the species has come to be as broad or much broader than the breadth about the middle or apex. Such transitional changes in general shape and outline of the leaves require comparison of leaves from approximately the same areas on the main stem or branchlets if differentiation is to be made.

The texture of the leaves is exceedingly characteristic of many species. Most of the species have firmly membranaceous to subcoriaceous leaves, but there is much diversity. *Grindelia integrifolia* has membranaceous leaves, quite thin for the genus. Many of the coastal species show interesting correlations between leaf texture and environment. For example, *G. Blakei* and *G. humilis* and varieties of salt marshes and tidal estuaries develop leaves of very thick, coriaceous or leathery-fleshy texture, whereas *G. stricta, G. stricta* var. *procumbens,* and *G. stricta* var. *macrophylla* of tidal estuaries, salt marshes, or sandy beaches along the seashore have soft, fleshy leaves which are quite thin when dried and pressed. *Grindelia arenicola* var. *pachyphylla* of coastal sand dunes also develops thick, coriaceous or leathery-fleshy leaves.

The color of the leaves is a remarkably constant and definite taxonomic-genetic character for the different species. The dull or pale grayish or bluish green shades definitely mark such species as *G. perennis, G. squarrosa, G. squarrosa* var. *nuda* and var. *serrulata,* pale yellow and light grass-green stamp *G. integrifolia*, *G. lanceolata*, *G. nana*, *G. arizonica*, and *G. texana*, whereas various types of dark greens characterize *G. humilis*, *G. Blakei*, and *G. rubricaulis* var. *robusta*.

Also of distinct taxonomic significance are the relative abundance and conspicuousness of resinous secretion in the leaves. In *G. camporum*, *G. squarrosa*, and its var. *nuda* the leaves are conspicuously punctate with resin-secreting areas, and the abundant resinous secretion frequently gives the surface a lustrous or almost varnished appearance. In other species, namely *G. hirsutula* var. *brevisquama*, *G. stricta* var. *macrophylla*, *G. lanceolata*, *G. inuloides*, *G. Greenmanii*, and *G. oolepis* the resinous secretion is so slight or negligible and the punctate areas so inconspicuous that the leaf does not appear at all resinous-punctate. Some species, like *G. squarrosa* and its var. *nuda* and *G. microcephala* var. *adenodonta*, have the closely and finely pectinate-serrulate or denticulate margins conspicuously resiniferous at the apex of the teeth, whereas many of the species lack resiniferous-tipped teeth.

ARRANGEMENT OF HEADS

The real inflorescence, as in all Compositae, is a capitulate one with a centripetal plan. In defining the type of inflorescence treated, the writer has regarded a single head as if it were a single flower. The mode of branching in the genus is always centrifugal or determinate, with the central head, which terminates the first developed axis, being the first to flower. The heads are sometimes disposed terminally on simple, unbranched stems, as in *G. globularifolia*, *G. chiloensis*, and *G. inuloides* var. *glandulosa*, but more often are arranged on few- to many-branched stems. The mode of branching (not as to flowering) is most often corymbose or subcorymbose, typically exemplified by *G. squarrosa* and *G. lanceolata*. By elongation and irregularity in branching of the lateral axes a paniculate or subpaniculate type of branching may develop, as in *G. inornata*, *G. procera*, *G. humilis*, and *G. fastigiata*. When the lateral axes become more approximate and closely ascending they may produce a fastigiate appearance, as in *G. arizonica* var. *stenophylla*, *G. nana* and var. *turbinella*, and *G. fastigiata*. In *G. aggregata* the heads are agglomerated into a compactly arranged cluster, terminating simple, short, subracemosely or subcorymbosely branched floriferous branchlets.

HEADS

The heads are always homochromous and yellow; both radiate and discoid heads occur. Among the South American species only one discoid species, *G. discoidea,* is known. In Mexico *G. oxylepis* var. *eligulata* is discoid, whereas in the rest of North America discoid examples are met in *G. columbiana, G. rubricaulis* var. *bracteosa, G. oolepis, G. aphanactis, G. fastigiata, G. inornata,* and *G. squarrosa* var. *nuda.* Those species of *Grindelia* possessing radiate heads are by far in the majority.

When the heads are discoid all the flowers are tubular, actinomorphic, and perfect. When the heads are radiate and heterogamous, all the tubular disk florets are perfect, and the radiate florets are ligulate and pistillate.

The heads in all the species contain numerous florets, and a direct correlation exists between the size of the head and the number of its florets; such species as *G. oolepis, G. decumbens, G. laciniata, G. oxylepis* f. *capitellata, G. nana* var. *integerrima, G. tenella,* and *G. Robinsonii* with comparatively small heads possess far fewer florets than such large-headed species as *G. rubricaulis* var. *robusta, G. lanceolata, G. subalpina* var. *erecta, G. Blakei,* and *G. camporum.* While the heads of a given species average a more or less constant number of florets per head, yet the use of such a character has not been found of significance in the taxonomy of the group.

DISK

The shape of the disk is a definite character to be relied upon in *Grindelia.* The genus as a whole is typified by a subhemispheric or campanulate-hemispheric type of disk. In a number of species like *G. squarrosa, G. camporum,* and *G. rubricaulis* var. *robusta* the disk is depressed-hemispherical, in *G. arizonica, G. Hallii, G. decumbens,* and others it is campanulate or campanulate-hemispherical, and in well developed heads of *G. fastigiata* and *G. nana* var. *turbinella* it becomes deeply campanulate.

INVOLUCRE

After many attempts toward a natural classification of the genus, working with different criteria, the author has had to rely upon the characters of the involucre as a basis for major or minor divisions. As a criterion of definite taxonomic value the involucre serves not only as a convenient and readily usable character but also as an extremely natural one; moreover, the involucral characters in *Grin-*

delia are as fundamental as those of the pappus and achene. The involucre is always more or less graduated; sometimes the outermost bracts subtending the heads become so foliaceous as to obliterate the graduated appearance, as in *G. hirsutula* f. *patens*. The involucre is mostly 4–6-, sometimes 7–8-seriate.

Perhaps as a result of an evolutionary adaptation to environmental conditions, the resinous character of the involucre has become definitely tied up in the genetic constitution of the various species. Species of *Grindelia* growing in arid, dry, wind-swept habitats, where paucity of rainfall exists and where evaporation is great, as on prairies, plains, dry places along streams, semi-desert areas, and the like, often develop large quantities of resinous substances on the involucre. Examples of this type of correlation are found in *G. nana*, *G. squarrosa*, *G. fastigiata*, and *G. perennis*. On the other hand, species growing under conditions of more abundant rainfall or where the habitat is otherwise associated with more moisture often show much less quantities of resinous exudate, as in *G. integrifolia*, *G. stricta* and var. *macrophylla*, and others. The amount of resin present differs according to the species. It is very conspicuous and abundantly secreted in *G. nana*, *G. squarrosa*, *G. camporum*, *G. Blakei*, and *G. fastigiata*, whereas in *G. oolepis*, *G. Greenmanii*, *G. Palmeri*, *G. hirsutula* var. *brevisquama*, *G. scabra* var. *neomexicana*, *G. stricta* var. *macrophylla*, and others it is so scarce as to appear almost lacking; in many of these cases only the innermost bracts or the youngest heads produce any obvious resin secretion.

Many of the species, preceding and during the first stages of anthesis, exude a large amount of resinous substance which accumulates in excess at the summit of the head in the form of a white or cream-colored, sticky, viscous mass. This sticky mass diminishes in extent more or less in proportion as the centripetal evolution in anthesis progresses, some of it probably evaporating. This phenomenon is well observed in such resinous species as *G. squarrosa*, *G. subalpina*, *G. nana*, *G. camporum*, and many others.

The position of the involucral bracts is a very definite and useful character in distinguishing the various species. Whether the upper portions of the bracts are erect-appressed, ascending, spreading, reflexed-squarrose, or revolute is of fundamental taxonomic importance, but it is a character which must be used and studied carefully, and due allowance must be given for slight variations or for abnormally developed involucres. Interpretation of the position of the bracts on herbarium material may sometimes lead to confusion, particularly when one is not experienced with the group. For example, a species which has the upper portions of the bracts revolute or strongly recurved or reflexed-squarrose may, when pressed and dried, have those bracts in the plant press straightened or curved out of the normal position. On the other hand, the upper portions of bracts which in nature are ascending or spreading, with straight tips may, upon being placed in the plant press, appear to be squarrose or abruptly bent back. If in such cases one will examine those portions of the involucre and bracts which have been least disturbed, such as near the base of the involucre or the sides, which have not had direct pressure applied to them, one usually will be able to decide what is the normal position of the bracts.

For the sake of clarity, the author desires at this point to explain the terms used in the keys and descriptions of the monograph for the various positions of the involucral bracts. Assuming that the original position of the upper portion of a bract were erect-appressed, it would pass through the following changes in the natural sequence of turning down, namely: erect-appressed, erect-ascending, ascending, spreading, horizontally spreading with straight tips, simply squarrose, slightly reflexed-squarrose, moderately reflexed-squarrose, strongly reflexed-squarrose, or recurved, then loosely and finally strongly revolute. Theoretically, all these terms denote definite positions; practically, only a few of them have been maintained.

Erect, ascending, and spreading are clear enough, but the stages between squarrose and revolute types grade into one another, and are sometimes difficult to construe. The bracts are squarrose only when the upper portions are projecting or spreading horizontally outward with the tips slightly sloping gradually downward or when slightly descending; in other words the bracts describe a more or less low-convex arc. As the tips of the bracts become more abruptly bent downward they pass into the reflexed-squarrose condition. At times, as often in *G. camporum*, the flexure at the tip is so abrupt downward in respect to the horizontally spreading portion as to give almost a geniculate or deflexed condition. For the sake of clarity and because the deflexed condition is often inseparable from a moderately or strongly reflexed one, only the term reflexed-squarrose is here used. The reflexed-squarrose condition may be only slightly marked or may become strongly bent downward. From this position, by the tip becoming more and more turned downward and then inward and upward, a recurved condition arises.

When the tip becomes farther curved upward it assumes a revolute appearance. A loosely or openly revolute bract is one in which the curvature described is rather gradual, and in which the revolute part of the bract shows obvious spatial separation between proximate portions. This condition is well exemplified by *G. Blakei.* A closely revolute condition is here used to express a further degree of revoluteness, in which the curvature described is more abrupt, and in which the revolute part of the bract is more tightly fitted within the curvature, giving a crowded, compact appearance to the figure. This is well observed in *G. revoluta* and *G. nana* and var. *integerrima.* The upper portion of the involucral bract may be involute, the tip becoming upwardly and inwardly recurved. This condition is best seen in *G. grandiflora.*

The upper portion of the involucral bract then is quite characteristic and for the most part constant. All the Mexican and South American species have either erect, ascending, spreading, or slightly reflexed-squarrose tips (the outermost may be slightly recurved at tip), but they are never revolute nor conspicuously recurved as in many North American ones.

In *G. oolepis, G. arizonica,* and *G. hirsutula* var. *brevisquama* the bracts as a rule are broadly lanceolate or ovate-lanceolate with short, acute to slightly acuminate tips. In most of the species the apex becomes more or less elongated, often slenderly filiform-subulate. The latter condition is very accentuated in *G. integrifolia, G. stricta* var. *macrophylla,* and *G. lanceolata.* In the last two species the free portion of the tip may be as long as 10–12 mm. and the outer and middle bracts may be free for one-half to three-fourths their total length, whereas in species like *G. humilis, G. arizonica, G. nana* var. *integerrima,* and others, in which the uppermost portion only is loose, the erect-ascending or revolute portion may be free only one-fifth or less the total length. There are all gradations between these extremes.

The texture of the bracts is mostly correlated with that of the leaves. Thin, membranaceous-leafed species, like *G. integrifolia,* possess similar types of bracts, whereas species possessing subcoriaceous or coriaceous leaves, like *G. squarrosa* and *G. arenicola* var. *pachyphylla,* show a similar development in texture in the involucral bracts. The tips of the involucral bracts may be conspicuously thickened and terete, as in *G. squarrosa, G. perennis, G. fastigiata, G. nana,* and *G. revoluta,* or may be only scarcely or not at all thickened and mostly flattened, as in *G. stricta* var. *macrophylla, G. inte-*

grifolia, and *G. hirsutula* var. *brevisquama.* In most of the species the upper portions of at least the inner and often the middle and outer bracts are resinous-punctate, either conspicuously and abundantly to slightly or less marked. In some of the thin, membranaceous, flattened, and scarcely or not at all thickened types the resinous-punctate areas are almost negligible.

In most of the species the involucral bracts are entirely glabrous. A short, villosulous or hirsutulous type of pubescence is found on the bracts in *G. hirsutula* and var. *brevisquama* and f. *tomentulosa, G. rubricaulis, G. stricta* var. *Hendersoni,* and var. *lanata.* Sometimes a short, glandular puberulence occurs on the outer or middle bracts, as in *G. inuloides* var. *glandulosa.*

In some species, like *G. arizonica,* the tips of the outer and middle bracts are conspicuously greener than the lower portions, whereas in *G. scabra, G. stricta, G. lanceolata,* and many others the bracts are uniformly green throughout.

RECEPTACLE

The receptacle of *Grindelia* is mostly flat or very slightly convex. In some species, such as *G. squarrosa,* the sides distend conspicuously downward in fruit, but most of the species do not exhibit this property. The receptacle goes through a definite sequence of development from the period of anthesis to that of fructification. The author has been able to observe from field study the series of changes which take place in *G. squarrosa* and *G. lanceolata.*

At least in *G. squarrosa* and *G. lanceolata* the obvious changes are as follows: the centripetal sequence of anthesis, beginning with the ray florets, then the outer disk florets, and subsequently more and more centripetally, allows the outer portion of the head to flower earlier and to be pollinated sooner than the inner and central part, and just as soon as the first ray and outer disk florets have come into anthesis, various dipterous, hymenopterous, and coleopterous insects ensure pollination and resulting fertilization. Consequently, these outer florets begin the process of ripening the seed even before the central and inner ones have even reached anthesis. The centripetal development of the florets in *G. squarrosa* goes on at a faster rate, with consequently a shorter period of anthesis for the entire head, than the corresponding development of the florets in *G. lanceolata.*

During the centripetal evolution of the florets in each species the receptacle increases in size. The outer margins of the receptacle grow and gradually extend upward. During these changes the involucral bracts increase in size and elongate somewhat. Gradually the involucral bracts, especially the inner ones, together with the vigorous upwardly growing margin of the receptacle bend upward and inward centripetally. The inner bracts extend more and more centripetally and begin to close over the center of the head. Many of the central disk florets have not reached anthesis at this time or, if they have reached it, have been in that stage only a relatively short time.

Finally, the head becomes practically closed above by the growth inwardly of the receptacle and inner involucral bracts. At this stage the shape of the disk has become changed from its original appearance at the beginning of anthesis; it has now taken on a broadly conical or turbinate shape, the sides at the middle or base distending conspicuously outward and narrowed conspicuously at the top. When the head is examined at this stage the innermost disk florets frequently are found not to have been pollinated nor even to have reached anthesis. The heads remain closed over in this condition during the ripening and maturing of the seeds.

After a considerable lapse of time, as much as two or three months, the inner involucral bracts and the receptacle begin to show signs of losing their turgidity and original position; the inner bracts begin to bend upward and gradually outward while the margins of the receptacle are going through similar outwardly directed movements. Gradually the central and outer portion of the head again become exposed. In time the entire head is open and, except for its obvious increase in size, takes on the appearance which it possessed at the beginning of anthesis.

The opening of the head occurs only after the seeds are fully ripe. We see that the most striking phenomenon has taken place, namely the ray and outer disk florets have ripened seed, but practically all the numerous central and innermost disk florets (always hermaphroditic) have failed to ripen. This fact the author believes to be explained as follows: the ray and outer disk florets, being the first in the head to be in anthesis, require sufficient nourishment to ripen their seeds. The more central disk florets are placed at a disadvantage in flowering much later, for by the time they have gone into anthesis and have been pollinated the outermost ones have already begun to ripen seed and have monopolized the food supply, with the result that the central disk florets are gradually starved at the expense of the outer ones.

Also correlated with the lack of formation of seed in the central disk florets is the fact that the head becomes closed over by the involucral bracts before the central disk florets have gone into anthesis, or when they have been in anthesis only a short time. While these observations were made in the field only on *G. lanceolata* and *G. squarrosa,* the author has observed among the thousands of herbarium specimens that most, if not all, of the other species in the genus show heads which have produced ripe seeds on the ray and outer disk florets, whereas the central and innermost disk florets have failed to ripen seed.

The receptacle in most of the species is deeply foveolate. In *G. oolepis* there is scarcely any indication of a foveolate receptacle. The nature of this foveolation is worthy of note. Each foveola is bounded more or less on four sides by fleshy processes, which in anthesis surround the entire ovary, and in fructification subtend the base or lower part of the achene. These fleshy processes are often thick and turgid during anthesis as in *G. lanceolata.* Moreover, the foveolae occur in rows spirally arranged in clockwise fashion, each floret being subtended by a foveola, and consequently also arranged spirally in rows. Moreover, the fleshy processes protruding upward from the four sides of a foveola may become remarkably elongated, and attenuated to a sharply acute or acuminate apex. In this latter condition they appear very much as if they were reduced or degenerate paleae.

COROLLA

The disk florets, as has been stated previously, are always tubular and perfect, and the ray florets when present are always ligulate and fertile. The corollas are always glabrous.

RAY FLORET

The number of ray florets varies in each species, but for each species averages a more or less constant number. For example, in *G. tenella* the number of ray florets is ordinarily 15–18, whereas in *G. maritima* and *G. squarrosa* it is usually 25–35. The ligule generally is quite conspicuous and usually oblong or elliptic-oblong, or it may be narrowly linear-oblong to broadly oblong-spatulate. It varies from 5–7 mm. long in *G. Robinsonii* to 17–22 mm. long in *G. Nelsonii,* and in *G. Blakei* up to 25 mm. long. It is quite slender, only 1.5–2.5 mm. broad, with usually revolute margins, as in *G. squarrosa,* or relatively broad, 4–5 mm., with non-revolute margins, as in *G. stricta* var. *macrophylla.* Moreover, the ligule is obtuse or acutish, obscurely 3-lobed or practically subentire at the apex and narrowed below into a slender, straight tube 3.5–7 mm. long. The color of the ligule is usually quite characteristic for the different species. Some species, *G. squarrosa* and *G. nana*, are pale or lemon-yellow-colored. Others, like *G. perennis*, *G. humilis*, *G. stricta* and varieties, are bright to orange-yellow, while *G. grandiflora* possesses orange-colored ligules. Those species inhabiting salt marshes, estuaries, and found in general near the coast develop a deeper, brighter orange-yellow than the ones inland. This deeper pigmentation may be associated with a higher salt content of the soil resulting in a denser protoplasm associated with higher osmotic pressure, or there may be some relation between the deeper pigmentation and the ability to absorb certain light rays which occur in coastal habitats.

DISK FLORET

The disk corollas are always some shade of yellow. They all are tubular, slender, and gradually or abruptly constricted about halfway down into a slender, straight tube. The lobes of the 5-toothed limb are short, 0.5–1.2 mm. long, lanceolate, oblong to ovate-lanceolate, acute or acutish. The veins are sometimes more prominent in certain species than in others, where, for example, as in *G. grandiflora* the veins are rather conspicuously brownish contrasted with the yellow color on the other parts.

The corolla is always 5-nerved and presents the usual condition found in the Compositae. Miss Koch,[1] in her anatomical studies concerning the composite flower, showed that the floral anatomy of the floret in *Grindelia* is very similar to that found typically in the Heliantheae, and not at all like those studied in the Astereae.

The disk corolla is too homogeneous and stereotyped in plan to offer any practical service in the differentiation of species or varieties, although the author has attempted many times to find characters which might be of use to segregate his entities as Wiegand did for the allies of *Aster lateriflorus* and *A. paniculatus*.

ANDROECIUM

The androecium of *Grindelia* is yellowish throughout and consists of five connate anthers with more or less elongate-oblong, oblong-lanceolate, or ovate, acutish or obtuse, terminal appendages and short, broadly deltoid or ovate bases. It is very homogeneous throughout the genus, the only variations occurring in the relative length and shape of the terminal appendage, but there is not sufficient noticeable variation in this character to apply it to practical use as a taxonomic criterion.

---

[1] M. F. Koch. Studies in the anatomy and morphology of the Composite flower II. The corollas of the Heliantheae and Mutisieae. Amer. Journ. Bot. 17: 1001–1002. 1930.

GYNOECIUM

The elongated arms of the style are quite different in the ray and disk florets. In the ray florets the style has two erect or ascending, slender branches, the papillate stigmatic lines following along the margins. The branches are glabrous or practically so on the inner and outer faces. In the disk florets the style also bears two erect to slightly spreading, straight branches, but each branch terminates in an ovate-oblong to narrowly linear-lanceolate, acute or obtuse appendage which is sparsely to densely hispidulous- or hirsutulous-pubescent on the external dorsal surface and along the margins, and glabrous on the internal ventral surface. The papillate stigmatic lines extend along the margins of the stylar branches to the base of the terminal appendage. The shape of the terminal appendage has proved to be of some limited use as a taxonomic criterion. Some species, *G. camporum*, *G. procera*, and *G. nana*, possess a relatively elongated, narrowly linear-lanceolate, acute or acuminate terminal appendage, in contrast to others, such as *G. rubricaulis* var. *robusta*, *G. squarrosa*, *G. maritima*, *G. texana*, *G. glutinosa*, *G. scabra* var. *neomexicana*, and many other species have relatively shorter and broader, oblong or oblong-lanceolate, obtuse to acute terminal appendages. In some species the terminal appendage is much more densely hirsutulous-pubescent on the outer dorsal surface than in others.

PAPPUS

In many ways the pappus characters permit of ready aid in the differentiations of species. The pappus in *Grindelia* is always strongly caducous, and this property distinctly separates it from all genera in the Astereae.

The pappus of a single floret consists of comparatively few awns or bristles, usually 2–10. According to Cabrera,[1] *G. buphthalmoides* may have as many as 15 or even more bristles. A number of South American species have 6 10 bristles to the florets, whereas the Mexican species possess mostly 2–3, sometimes 4 on the ray and outer disk florets. Some of the North American species, such as *G. texana*,

---

[1] A. Cabrera. Revisión de las especies sudamericanas del género "*Grindelia*." Rev. Mus. La Plata 33 : 224. 1931.

G. microcephala var. *adenodonta*, *G. lanceolata*, *G. nana* and *G. camporum* have only two bristles to the floret (*G. camporum* sometimes has three), whereas others, *G. subalpina* and var. *erecta*, usually have 4–8. *Grindelia rubricaulis* var. *latifolia* of the Santa Barbara Islands and the adjacent California coast may have as many as nine to the floret. When two bristles are present, they are found at opposite angles. When 5–9 or more are present, they are borne at and between the angles of the achene. Often two or more are found about each angle.

The number of bristles to the floret, though often variable, constitutes an important taxonomic character, since each species is characterized by a certain definite number of bristles to the floret. Great care is required, however, in determining this accurately. The number of bristles per floret may be the same throughout the head in some cases, whereas in many other instances the number on the ray floret will exceed that on the disk floret. It is often possible to find florets which have all the bristles in place, and to obtain a certain count, but the bristles are so easily caducous that their numerical determination is a very difficult problem. At the mere touch of a dissection needle the bristles in a head which is in anthesis readily disengage themselves from the achene. Furthermore, the florets in a head are closely packed together and they as well as the bristles are covered with resinous secretion; consequently, when one attempts in a dissection to separate one floret from another or a group of florets from another group, the bristles become easily separated from the achene and fall off or become transferred by their sticky surfaces to another floret. The author has often spent tedious hours making dissections of many heads of a plant in his attempt to be certain of the number of pappus bristles in one floret.

The best method found by which one may obtain more or less certain numerical determinations of the number of bristles to a floret in herbarium is to boil very young heads or those which, at least, have not reached anthesis, and then make the dissections of this material. In the young heads and in those which have not reached anthesis the connection between the achene and the bristle is still weakly intact.

Another method which is sometimes the only other alternative and which with careful dissection often yields more or less certain results is that of counting the total number of bristles in a head as well as the total number of florets and dividing the former by the latter. This latter is sometimes the only method available where all the heads are in a mature condition. It is the very caducous nature of the pappus which has caused previous inaccuracies concerning the number of pappus bristles.

The relative length of the pappus bristle compared with that of the entire corolla of the disk floret is another character of taxonomic significance. In some species, *G. texana*, *G. lanceolata*, *G. scabra* var. *neomexicana*, *G. inuloides* var. *adenodonta*, *G. littoralis*, and *G. camporum*, the bristle is as long or nearly as long as the length of the corolla of the disk floret, whereas in *G. integrifolia*, *G. integrifolia* var. *virgata*, *G. rubricaulis* var. *elata*, and a few others it is only one-half to two-thirds the length of the corolla of the disk floret.

The relative width and thickness of the pappus bristle is a character of importance. In all Mexican species, in *G. microcephala* and varieties, and in *G. scabra* and var. *neomexicana*, the bristles are very delicate and capillary-like or filiform in appearance. Although they are not terete as true hairs, nevertheless they have the delicate, filiform appearance of hair, and are of the same narrow breadth from base to apex. All the other species have subpaleaceous, paleaceous, or strongly paleaceous bristles. The subpaleaceous type occurs in *G. Havardii*, *G. arizonica*, *G. aphanactis*, and others. They represent transitions from the capillary-like or filiform examples of the Mexican species to the more truly paleaceous types. As such transitions they are on the border line and are sometimes difficult to place. However, close comparison of these transitional, subpaleaceous forms with the real capillary-like types reveals the finer distinctions between the two. The strongly paleaceous types of bristles are best developed in the maritime or coastal species, such as *G. maritima*, *G. Blakei*, *G. rubricaulis* var. *latifolia*, and *G. camporum*.

A very interesting characteristic shown as regards the bristles is the relative curvature or straightness exhibited in the dried condition of herbarium material. All the Mexican species, and those showing close relationship to the Mexican types, such as *G. scabra* and var. *neomexicana*, *G. microcephala* and varieties, *G. grandiflora*, *G. oolepis*, *G. Havardii*, *G. arizonica* and varieties, *G. aphanactis*, and *G. decumbens* var. *subincisa*, possess fairly straight bristles when they are dry. Others, including the large proportion of species of the United States and Canada, possess bristles which are slightly to strongly curved or twisted when dry. This is well shown in *G. nana* and varieties, *G. maritima*, *G. Blakei*, *G. rubricaulis* var. *robusta*, *G. arenicola*, and many others. Those species with strongly paleaceous bristles or those which grow in proximity to the sea invariably exhibit strongly curved or twisted bristles when dry, whereas the types with delicate, capillary or filiform bristles invariably possess straight bristles in the dried state.

One of the most important diagnostic characters for the differentation of the species is the margin of the pappus. This is a taxonomic criterion which has either been entirely neglected by previous students or has been misused or erroneously treated. Several species, among them *G. texana*, *G. lanceolata*, *G. microcephala* and varieties, *G. nana* and varieties, *G. camporum* and varieties, *G. integrifolia*, *G. integrifolia* var. *virgata*, *G. Greenei*, *G. Greenmanii*, *G. tenella*, *G. Robinsonii*, *G. oxylepis*, *G. inuloides*, *G. inuloides* var. *glandulosa*, *G. oolepis*, *G. Nelsonii*, *G. Palmeri*, and *G. subdecurrens*, have the margins of the pappus bristles entire or subentire (only remotely marked with a few short projections). Many others possess all degrees of serrulations.

For the sake of clarity, the author desires to explain at this time the terms used in his monograph in describing the pappus margins. The use of the terms "entire" and "subentire" is obvious and requires no explanation. Three main types of dentation are found on the margin of the pappus bristles in *Grindelia:* namely, first, the serrulate type with relatively short or minute, deltoid, broadly or ovate-lanceolate teeth, i.e. those about as long as broad or only 2 or 3 times longer than broad; second, the setulose type with relatively elongated, linear or subulate teeth, i.e. those many times longer than broad; and, third, the setulose-serrulate type—an intermediate condition between the first and second in which there may be both types (serrulate and setulose teeth) present or the teeth themselves may be intermediate in length between the serrulate and the setulose type. Among the three types themselves all gradations are found. There are again three general categories under each of the previous types: namely, first, remotely, second, moderately, and third, numerously toothed. In the first the teeth are few and rather distant from one another; the second type is intermediate in its degree of serration as to the proximity and number of teeth; in the third the teeth are abundant and numerous and relatively very close together. Therefore, we may have either remotely, moderately, or numerously serrulate margins, or remotely, moderately, or numerously setulose-serrulate margins, or again, remotely, moderately or numerously setulose margins. In *G. subalpina* and var. *erecta*, *G. scabra* and var. *neomexicana*, and *G. glutinosa* the bristles are numerously setulose. Between these types and those with entire margins are all stages.

The bristles are opaque, cream-colored, or pale brown, smooth, with shining surfaces, and are composed of many small, oblong cells. They are mostly compressed-flattened in the upper half or throughout or may be triquetrous below or in the lower half. They usually taper gradually from base to apex to an acute or an acuminate tip, but in some species, *G. microcephala*, *G. microcephala* var. *adenodonta*, *G. texana*, and a few others, they are dilated or enlarged at the tip.

ACHENE

The achenes of *Grindelia* are usually narrowly or broadly oblong and two to several times longer than broad. They vary from relatively small, approximately 1.5–2 mm. long and 0.75 1.5 mm. broad, to relatively large, 5 7.5 mm. long and 2.5 3.5 mm. broad. In *G. microcephala* var. *adenodonta* they are depressed rhomboid or cuboid, therefore as broad as or sometimes broader than long. The achenes have a firm, glabrous, crustaceous or corky-thickened pericarp. They vary in color from stramineous or pale brown to dark brown, seal brown, or burnt sienna. The angles are often more thickened than the rest of the achene. The angles may be rounded or sharply acute, slightly winged, with a narrow, membranous portion, or not at all winged.

The achenes of the ray florets ordinarily differ in cross section from those of the disk florets. The latter usually being more compressed, at least on four sides, and being more crowded, are usually semi-flattened or compressed, therefore much broader than thick, appearing 2-sided only, and oblong, elliptic-oblong, or fusiform in cross section. In some species, *G. squarrosa*, *G. oxylepis*, *G. microcephala* var. *adenodonta*, *G. subdecurrens*, *G. inuloides*, *G. sublanuginosa*, and a few others, they are quadrangular or subquadrangular and rectangular or squarish in cross section. The ray achenes may be triquetrous, quadrangular, or subquadrangular, and are frequently much broader or have a greater diameter than those of the disk florets, particularly of the latter toward the center of the disk. The triquetrous ray achenes occur in the majority of species and are triangular or subtriangular in cross section, whereas the quadrangular or subquadrangular types which are squarish or rectangular in cross section are found mostly in many of the Mexican species, and some of those obviously closely related to or derived from the Mexican species, such as *G. microcephala*, and varieties, and *G. squarrosa*. In the triquetrous ray achenes the two inner faces are mostly straight, or sometimes slightly convex.

The surfaces of the achenes, particularly in the Mexican species, show diversities which are characteristic and definite for the different species, and thus serve as a very important diagnostic character in specific differentiation. In *G. nana* and varieties, *G. Havardii*, *G. lanceolata*, and *G. littoralis*, the surface of the faces is smooth and mostly free from surface irregularities. In *G. grandiflora* the achenes are conspicuously 9–10-costate or ribbed with slender, longitudinal ribs alternating with rather deep sulcations. In *G. aphanactis* the faces are as a rule deeply longitudinally ribbed and furrowed. In other species the achenes are irregularly or slightly ribbed only about the angles. Some of the maritime species, *G. humilis* and *G. Blakei*, have the faces grooved irregularly and longitudinally, or ribbed or thickened, the outer convex face in *G. humilis* often being irregularly roughened or thickened. Some of the Mexican species, *G. tenella*, *G. oxylepis*, *G. sublanuginosa*, and also the Texan *G. microcephala* var. *adenodonta*, have the faces finely or coarsely and irregularly rugose-wrinkled or convolutely rugose. In *G. oxylepis* this convolute rugosity is very fine, while in *G. sublanuginosa* and *G. microcephala* var. *adenodonta* it is much coarser and deeper.

Diversity in the type of apex about the areola of the achene at maturity offers differentiating specific characters of fundamental, deep-seated importance. Two main types are present, one in which the apex of the achene is horizontally or obliquely truncate, the other in which the areola is bordered at the angles with little, toothlike processes or knobs, or the angles and margins between the angles may develop a shallow or prominulous, irregularly undulate or thickened ridge or upraised rim. This rim may be more prominently developed at one of the angles and thus appear like a knob or toothlike process, or it may be developed at all the angles. The knobbed or toothlike angles at the apex are commonly encountered in many of the Pacific Coast species, such as *G. camporum* and varieties, *G. rubricaulis* var. *robusta*, *G. hirsutula* and varieties, *G. procera*, *G. maritima*, and *G. humilis*, and in some other species like *G. columbiana*. *Grindelia nana* and varieties have 1–3 very short projections or knobs, and *G. texana* and *G. lanceolata* of the south-central United States and Texas have 1–2 very short processes at the apex or only a shallow, upraised rim. All the Mexican species have horizontally truncate apices. *Grindelia squarrosa*, *G. arizonica* and varieties, *G. subalpina* and var. *erecta*, *G. microcephala* and varieties, *G. perennis*, *G. inornata*, and other interior land types have the apices of the achenes horizontally or obliquely truncate.

It should be emphasized, however, that as in *Carex* neither the surface markings on the achene, nor the shape and size, nor the type of apex can be used as critical characters unless the achenes of the specimens examined are fully mature. Otherwise confusion is likely to result. The achenes of *G. microcephala* var. *adenodonta*, for example, are smooth to slightly rugose in the early stages, but at maturity, and not until then, are conspicuously and convolutely rugose-wrinkled. In some of the Mexican species like *G. inuloides*, *G. subdecurrens*, *G. Robinsonii*, *G. Palmeri*, and *G. Greenmanii* the faces are mostly smooth in the beginning and do not show signs of shallow wrinkling or other rugosities until late maturity. Great care must be taken in using achenial characters in the key to species, varieties, and forms in the monograph.

A NEW GRINDELIA FROM MEXICO

Grindelia confusa Steyermark, sp. nov.—Herba perennis, caulibus tenuibus, pluribus, adscendentibus, monocephalis vel paucicephalis, dimidio superiore villosiusculis, 1.5–2 dm. altis; foliis per omnes partes plerumque aequalibus firmiter membranaceis, salienter vel spinulose dentatis, 1.5–3.3 cm. longis, 0.2–0.5 cm. latis, linearibus, acutis, minute glandulosis; capitulis radiatis, 2.5–3 cm. latis; disco campanulato-hemispherico, 0.7–0.8 cm. alto, 1.3–1.5 cm. lato; involucro parce resinoso, involucri bracteis apice patentibus vel paullo squarrosis, exterioribus et mediis 5–6 mm. longis, ca. 0.5 mm. latis, tenuibus, lineari-subulatis, glabris; ligulis 25–31, 8–9 mm. longis, ca. 2 mm. latis; achaenio immaturo laevi; aristis 3–5, tenuibus, modice setulosis, 3–4 mm. longis, ca. ⅞ longitudinem disci floris aequantibus.—Mexico: Chihuahua, swale, Namiquipa plains, *Harde LeSueur 1016*, August 17, 1936 (type in Herbarium of Field Museum).

Grindelia confusa from the Chihuahuan plains, with its spinulose-dentate, linear leaves and moderately setulose awns, differs from all the other Mexican species. It is most closely related to *Grindelia laciniata* of Arizona and southeastern Utah, differing chiefly in its involucral bracts, which are linear-subulate with free, spreading, slender tips, in its more spreading-ascending stems which are pubescent instead of glabrous, in its more setulose pappus awns, and in its leaf margins, which are spinulose-dentate rather than pinnatifid.

It is somewhat of a surprise and rather disconcerting to encounter such a distinct new species, not only because the author has already monographed the genus, but also because the characters of this new species spoil some of the key characters based upon geographical distinctions and awn characters. It actually combines the habit, pubescence, and involucral bracts of some of the Mexican species with the leaves and pappus awns of some southwestern United States species.

As this paper goes to press, it is somewhat unusual to record another species of *Selenia*, *S. grandis* Martin, newly described from the same county in Texas as that from which *S. oinosepala* has been found. That the two species are totally distinct, however, is borne out by the much smaller and entirely different colored sepals of *S. oinosepala* and by the twice as large petals of *S. grandis*.

GENUS LABORDIA

HAWAIIAN EUPHORBIACEAE

LABIATAE AND COMPOSITAE

BY

EARL EDWARD SHERFF
RESEARCH ASSOCIATE, SYSTEMATIC BOTANY

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME XVII, NUMBER 6
SEPTEMBER 30, 1939

PUBLICATION 453

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

PREFACE

Several years ago I was urged by Mr. Otto Degener, author of the currently appearing Flora Hawaiiensis, and somewhat later by Dr. Carl Skottsberg, Director of the Arboretum of Gothenburg, to undertake a revisional study of the Hawaiian genus, *Labordia*, of the family *Loganiaceae*. In due course of time such a study was made. During its progress, facilities for research were afforded me by the Field Museum of Natural History and it is a pleasure to acknowledge here my indebtedness to the authorities of the Museum.

Various other institutions and certain private workers very generously co-operated in the lending of plant materials, without which any attempt at revisional study of *Labordia* would have been largely futile. More particularly must I express my indebtedness and gratitude for such aid to the following individuals: Dr. Ludwig Diels, Director, Botanical Garden of Berlin; Dr. Peter Buck, Director, Mr. Edwin H. Bryan, Jr., Curator of Collections, and Dr. Harold St. John, Botanist, Bernice Pauahi Bishop Museum; Dr. Karl McKay Wiegand, Professor of Botany, Cornell University; Mr. Otto Degener, owner and custodian of the Degener Herbarium, Honolulu; Dr. B. P. G. Hochreutiner, Director, Delessert Herbarium; Dr. Carl Skottsberg, Director, Gothenburg Arboretum; Dr. Merritt Lyndon Fernald, Director, and Mr. Charles A. Weatherby, Senior Curator, Gray Herbarium of Harvard University; Sir Arthur W. Hill, Director, Royal Botanical Gardens of Kew; Dr. Carl Otto Rosendahl, Chairman of Department of Botany, University of Minnesota; Dr. George Thomas Moore, Director, and Dr. Jesse More Greenman, Curator of Herbarium, Missouri Botanical Garden; Dr. Karl Keissler, Director, Department of Botany, Natural History Museum, Vienna; Dr. Henry Allan Gleason, Head Curator and Assistant Director, New York Botanical Garden; Dr. H. Humbert, Professor, Museum of Natural History, Paris; Dr. William R. Maxon, Curator, United States National Museum; and Dr. F. R. Fosberg, recently of the University of Pennsylvania.

As in the case of former revisional investigations, photographs were taken of practically all available type specimens and of numerous cotype[1] or otherwise important supplementary specimens. A set of these is in my own collection and a duplicate set is in the Herbarium of Field Museum of Natural History.

---

[1] The term "cotype" is used throughout to connote a *duplicate of the type* (i.e., a paratype).

An attempt has been made to cite fully all *exsiccatae* examined. It must be noted, however, that in the case of plants collected by Mr. Degener and his associates, I have usually been permitted to examine the entire set of undistributed duplicates for any one collection number. So, too, for the collections of unmounted materials lent by Bishop Museum, it has been possible to study in numerous instances a representative set of undistributed duplicates. It is probably needless to add that from a study of so much additional material, supplemented many times by privately cummunicated field data from the collectors themselves, invaluable aid has been received in the interpretation of various taxonomic entities within the genus.

GENUS LABORDIA

EARL EDWARD SHERFF

HISTORY OF THE GENUS

The history of *Labordia* is simple, direct, and lacking in complications. The genus was founded by Gaudichaud in 1830 (Voy. Freycinet Bot. 449). He based it upon a single species, his own *Labordia Fagraeoidea*, the type of which he had found on the Island of Oahu in 1819. Gaudichaud spelled the generic name *Labordia*, although he created the name in honor of Mr. Laborde, an officer-of-marine and an unfortunate companion who had died at sea in the vicinity of the Isle of France. Subsequently, Asa Gray (Proc. Amer. Acad. 4: 321. 1860) and William Hillebrand (Fl. Haw. Isls. 288. 1888) used the spelling *Labordea* and this spelling gained limited acceptance in literature and in herbaria. The original spelling *Labordia* must be retained according to rules, however, and in fact has been accepted by most of the abler authorities who have treated the genus (e.g., Alphonse De Candolle, Prodr. 9: 21. 1845; Bentham & Hooker, Gen. Pl. 2: 792. 1876; Hans Solereder in Engler & Prantl, Natürl. Pflanzenfam. ed. 1, 4^{II} : 32. 1895; Joseph F. Rock, Indig. Trees Haw. Isls. 401. 1913; Wolfgang Klett, Botan. Archiv 5: 323. 1924; Otto Degener, Fl. Haw. fam. 302, Aug. 10. 1932; and Harold St. John, Occas. Paps. Bish. Mus. 10: no. 4: 4. 1933).

In 1860, Asa Gray (loc. cit.) discussed at some length the relationship of *Labordia* Gaud. to its sister genus, *Geniostoma* Forst. He described three species, two of them intended as new: *L. Tinifolia* A. Gray, *L. Fagraeoidea* Gaud., and *L. sessilis* A. Gray. *L. Tinifolia* is retained in the present revisional monograph. *L. Fagraeoidea*, as described by Gray, was based on specimens by the South Pacific Exploring Expedition, from the Island of Hawaii, and becomes *L. Hedyosmifolia* var. *Grayana*. *L. sessilis* becomes *L. Fagraeoidea* var. *sessilis*. Gray attempted no complete treatment of *Labordia*, but in a rather indefinite way advanced the new name *Geniostomoides* for an implied generic section typified by his new *L. Tinifolia*. He recorded the aestivation of the corolla in (our) *L. Hedyosmifolia* var. *Grayana:* "the lobes of the corolla in aestivation decidedly, though narrowly, overlap in a convolute manner, and are slightly twisted towards the observer's left." So far as my observations on specimens extend, Gray's description applies substantially to the entire genus.[1] It may be noted here that at an earlier date Bentham had presumed the aestivation of the corolla in *Labordia* to be valvate and the fruit to be baccate (cf. Gray, loc. cit.), and that later Edouard Bureau (Fam. Loganiac. 44, fig. 9, footnote 1. 1856; cf. Gray, loc. cit.), on dissecting three flowers of *L. Fagraeoidea*, concluded Bentham's presumption of valvate aestivation to be correct. The large collections of material more recently available show, however, that the fruit is capsular and the aestivation is as Gray reported, or, to quote Hillebrand (Fl. Haw. Isls. 288. 1888), that the corolla-lobes are "sinistrorsely [cf. footnote 1] contorted in the bud, slightly overlapping."

Shortly after the publication of Gray's paper, Horace Mann made a noteworthy contribution to our knowledge of the genus (Proc. Amer. Acad. 7: 196 [Enum. Haw. Pl. nos. 383–387]. 1867). He described three new species: *L. pallida*, *L. hirtella*, and *L. membranacea*. All of these have proved valid. In addition, he discussed *L. Fagraeoidea* Gaud., referring to that species Mann & Brigham 434, a plant which, however, is seen to have been undescribed in Mann's day and which must be referred to *L. Hedyosmifolia* var. *centralis* of the present treatment. Mann erroneously synonymized Gray's concept of *L. Fagraeoidea* with his own new *L. pallida*. As already indicated, the material assumed by Gray to represent *L. Fagraeoidea* Gaud. is *L. Hedyosmifolia* var. *Grayana* as here treated.

In 1872, Heinrich Wawra wrote briefly upon *Labordia*, describing as new several plants which he had collected in the Hawaiian Islands from the end of December, 1869 to the first day of May, 1870. Of these, *L. waialealae* is to be retained and might indeed be considered as typifying a new section if it were not for the numerous transitional forms which occur and definitely unite it with sect. *Rabdolia*. His *L. pallida* f. *alpina* was later named by Hillebrand, *L. Fagraeoidea* var. *pumila* and more recently, and very properly, it has been raised by Skottsberg to specific rank (*L. pumila*). A species described by him from Oahu, *L. waiolanii*, reduces to *L. molokaiana* var. *phyllocalyx* of my text. We may note here that two of Wawra's specimens, his nos. 2,200 and 2,200*b*, were misdetermined by him as *L. Fagraeoidea* Gaud., although they were in reality an undescribed species. They will be found in this text as *L. Wawrana.*

---

[1] As has been remarked elsewhere, however, Gray's method of determining the direction of twisting for the corolla-lobes, while used by various other botanists, was such as to give a direction exactly opposite to that obtained by following the method used by the majority of botanists (cf. B. Daydon Jackson, Glossary Bot. Terms, ed. 3, 423, append. C. 1916). The lobes do, as Gray said, appear twisted to the observer's left, i.e. sinistrorse, if the corolla be held erect and viewed perpendicularly to its lengthwise axis and from the outside. This means, of course, that when viewed from above the corolla, the twisting is clockwise and is thus what may more properly be designated as dextrorse.

In 1880, Henri Baillon, writing "*sur la tribu des Labordiées*" (Bull. Soc. Linn. Paris 1: 238) discussed various species with special reference to sexuality of flowers and diversity among inflorescences. He concluded that *Labordia* must be merged with *Geniostoma.* He proposed two sections to include certain species of *Geniostoma* (in its contemplated broader sense), namely *Rabdolia* and *Darbolia.* He set forth five new species, besides discussing certain previously known ones. His paper was written in some respects very carelessly and lacked definiteness in treatment. His five new species were: *Labordia Echitis, Geniostoma Cyrtandrae, G. Remyana, L. Hedyosmifolia,* and *L. molokaiana.* It should be observed that while he had concluded *Labordia* to be reducible to *Geniostoma,* he continued to employ the name *Labordia* for certain of his binomials. He placed the first two of these five species in the section *Rabdolia.* The remaining three he seems not to have assigned to any section. He did, however, cite *L. Tinifolia* A. Gray as a basis for his second section, *Darbolia* (which will be recognized as equivalent to the earlier but less definitely established *Geniostomoides* A. Gray). In my own monographic study of *Labordia,* it has seemed wise to adopt both of the sections proposed by Baillon for *Geniostoma,* transferring them of course to the genus *Labordia.*

Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 156. 1936; see also p. 498 of the present text) regarded Baillon's five proposed names as representing "little more than nomina nuda." With the exception of *L. Echitis,* however, they were substantiated with sufficient descriptive matter to compel their recognition. *G. Remyana* is found to be synonymous with *L. Hedyosmifolia* var. *Grayana,* thus reducing Baillon's species to three that are valid. Of these three, *G. Cyrtandrae* was set forth later by Skottsberg (loc. cit.) as *Labordia Cyrtandrae* (although perhaps unwittingly). We have, then, three species of *Labordia* proposed by Baillon and here retained: *L. Cyrtandrae, L. Hedyosmifolia,* and *L. molokaiana.*

Following Baillon, but evidently with no knowledge of Baillon's work on *Labordia,* came William Hillebrand. In his Flora of the Hawaiian Islands (pp. 288–293. 1888) he presented the first comprehensive and systematic treatment of the genus. During his twenty years of residence and active botanical investigation in the Hawaiian Islands, Hillebrand had acquired a vast fund of information touching

Labordia. Much of this is revealed in his text. For the section *Geniostomoides* A. Gray, he employed the slightly different name, *Geniostomoideae.* For the rest of the genus he used the sectional designation *Labordeae verae.* In the *Geniostomoideae* (our *Darbolia*) he described the valid *L. triflora* and two unnamed varieties of *L. Tinifolia* (var. β=*L. Tinifolia* var. *parvifolia;* var. γ—as to first cited locality of Kauai=*L. Helleri* and var. *macrocarpa*). In the *Labordeae verae* (our *Rabdolia*) he described a number of new species and varieties, which are disposed of in my text as follows: *L. lophocarpa*=*L. molokaiana* var. *lophocarpa; L. lophocarpa* var. *pluriflora*=*L. molokaiana; L. lophocarpa* var. *phyllocalyx*=*L. molokaiana* var. *phyllocalyx; L. Grayana*=*L. Hedyosmifolia* var. *Grayana; L. glabra,* retained; *L. hirtella* vars. *microphylla* and *microcalyx,* retained.

Early in the present century, Joseph F. Rock collected *Labordia* extensively and tentatively created a number of new herbarium names which he later failed to publish. In his *Indigenous Trees of the Hawaiian Islands* (403–406, plates 164 and 165. 1913), he declared his intention of comparing "his specimens with the types in the various Herbaria of Europe." Notes on certain herbarium sheets in Berlin and elsewhere show that he made at least some comparisons, but his attention was later diverted to other matters and he never concluded a revisional study of the genus.

Almost contemporaneous with Rock's work was that of Charles N. Forbes. Hundreds of specimens of *Labordia* were collected and determined by him. His *L. kaalae* (Occas. Paps. Bish. Mus. 6: 174 and plate. 1916) and *L. Lydgatei* (op. cit. 176 and plate) were described from material collected or studied by him and have proved thoroughly valid. He left various notations upon the labels or the sheets to his specimens and these in many cases have been of value. Unfortunately, Forbes' untimely death, in 1920, terminated his labors upon *Labordia* and other Hawaiian genera.

In 1924, Wolfgang Klett (Botan. Archiv 5: 312) published his "Umfang und Inhalt der Familie der Loganiaceen." He presented a key to the thirty-three genera of Loganiaceae recognized by him, also descriptions of and critical notes upon each genus. In *Labordia,* which he retained as separate from *Geniostoma,* he gave the number of species as eighteen, although which ones these were he did not state.

Beginning at about the same time that Rock and Forbes and Klett did their work, numerous additional specimens of *Labordia* have been collected, notably by George C. Munro, by Otto Degener and his associates, by Carl Skottsberg, by Harold St. John, by

Francis Raymond Fosberg, and by Edward Yataro Hosaka. Of these specimens, certain ones were described by Degener (Fl. Haw. fam. 302, August 10, 1932) and by St. John (Occas. Paps. Bish. Mus. 10: no. 4: 4. 1933) under the name *L. hypoleuca* Deg., a name which, however, reduces to synonymy with *L. Cyrtandrae.* More recently, Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 153-164. 1936) has published a detailed study of *Labordia.* He described *L. Grayana* var. *centralis,* which is our *L. Hedyosmifolia* var. *centralis,* and, apparently with justice, elevated *L. Fagraeoidea* var. *pumila* Hillebr. to specific rank, our *L. pumila.*

Skottsberg's work is important, however, more particularly for its critical discussions. He reviews the history of *Labordia* regarding sexual dimorphism of the flowers. He refers to the previously used descriptive terms, *polygamous-dioecious* and *hermaphrodite,* only to discard them, almost for a certainty, in favor of a truly dioecious habit. To quote his own words: "In the specimens of the five species of *Labordia* examined by me I have not come across a single case of true hermaphroditism and I never found more than one kind of flowers, either staminate or pistillate, on the same branch. From this I conclude that at least these five species have unisexual and probably dioecious flowers." (It may be added here, incidentally, that throughout my own studies of *Labordia,* I have seen no certain evidence of any other than a dioecious habit. Very recently, however, Dr. Skottsberg has sent me a specimen of *L. Hedyosmifolia* Baill.—*Cranwell, Selling, & Skottsberg* 3166*b*—with the notation, "all flowers bisexual except one staminate.") Skottsberg presents many small, carefully delineated sketches of floral organs observed in the several species studied and the reader is referred to these for a deeper insight into the processes of anthesis and fructification in *Labordia.* Skottsberg's description of the situation preliminary to anthesis in staminate flowers likewise should receive attention: "Before the staminate flowers open, the anthers, which surround the pistil tightly, have deposited their pollen on the closed stigma which is densely covered with long porrect papillae and may act like a brush sweeping out the pollen. I have found pollen thick on the stigma above the tips of the anthers."

Following closely upon Skottsberg's paper was that by St. John (A Revision of the Hawaiian Species of *Labordia* Described by H. Baillon: Occas. Paps. Bish. Mus. 12: no. 8: 1-11, *pls. 1-4.* 1936). St. John, during his stay in Paris in 1936, had "investigated the types of the Hawaiian species of *Labordia* described by H. Baillon."

He presents a critical discussion which, though short, is of classic importance to our correct understanding of the genus. He agrees with Solereder in Engler and Prantl (Natürl. Pflanzenfam. 4^{II}: 30–31. 1895) in maintaining *Labordia* as a separate genus apart from *Geniostoma* and writes that they both "seem to have sufficient morphological characters. *Geniostoma* occurs from Madagascar to Fiji, and has the inflorescence from the lower leafy axils and the corolla-tube short rotate. *Labordia* occurs only in the Hawaiian Islands, and has the flowers terminal, single or in sessile or peduncled cymes, and the corolla-tube well developed, cylindric." He attempts no maintenance of subgeneric sections, having earlier committed himself (op. cit. 10: no. 4: 5. 1933), for what seems to me an ill considered and insufficient reason, in favor of abolishing sections within *Labordia*. He sets forth and pictures the type of *Geniostoma Cyrtandrae* Baill. with the professedly new combination *Labordia Cyrtandrae* (Baill.) St. John, but in an earlier paper known to and cited by him, though manifestly overlooked by him in this connection, Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 156. 1936) had already published this combination (though, as previously stated on page 451, perhaps unwittingly, since he incorrectly attributed the combination to Baillon himself). St. John then proceeds to *Labordia Hedyosmifolia* Baill. and *L. molokaiana* Baill., both of which he illustrates from photographs of the respective types and discusses briefly. To varietal rank under the former he very properly transfers *L. Grayana* var. *centralis* Skottsb. He places *Geniostoma Remyana* Baill. and *L. Grayana* Hillebr. as synonyms under *L. Hedyosmifolia*, but it should be observed here that these are better treated as var. *Grayana*, and this is accordingly done in my text. *Labordia Echitis* Baill. is recognized as a nomen nudum, but its type is illustrated with a plate fully described, and renamed *L. Baillonii* St. John.

A brief view in retrospect of the literature on *Labordia* shows some doubt to have obtained as to the validity of *Labordia* apart from *Geniostoma*. Thus Asa Gray (Proc. Amer. Acad. 4: 322. 1860), in establishing his new *L. Tinifolia*, wrote: "So we must annex this ambiguous species to *Labordia*, unless we merge the latter genus in *Geniostoma*, which at present would hardly be warranted." Bentham and Hooker (Gen. Pl. 792. 1876) took a strong stand in favor of retaining *Labordia* separately. Thus they wrote: Generis affinitatem maximam cum *Geniostomate* rite indicavit A. Gray, sed abunde distinguitur habitu, inflorescentia, calyce, corollae lobis angustis, et stigmate in laminas longas diviso. Hunc characterem in floribus in alabastro examinatis facile praetermissum, in speciebus duabus observavimus." However, Bentham and Hooker confessed doubt as to the affinity of *L. Tinifolia,* preferring to place it with *Geniostoma: "Labordia tinifolia,* A. Gray, l.c., corollae tubo pariter elongato characteres caeteros calycis styli etc. potius *Geniostomatis* quam *Labordiae* praebet, excepta inflorescentia quae terminalis pedunculata et laxe trichotoma cum neutro genere convenit." Hillebrand (Fl. Haw. Isls. 292. 1888) and all writers since his day known to me have, none the less, kept *L. Tinifolia* with *Labordia.* The discovery, since Bentham and Hooker's time, of several additional species which were clearly congeners of *L. Tinifolia* and which displayed a greater range of variation and overlapping with the orthodox *Labordia* species than noticeable in *L. Tinifolia,* confirms the wisdom of such a course. Indeed, St. John (Occas. Paps. Bish. Mus. 10: no. 4: 5. 1933) felt the transitions between orthodox *Labordia,* as represented by *L. Cyrtandrae* (*L. hypoleuca* Deg.) and *L. Tinifolia* to be such as to justify abolishing, as already stated (p. 454), sections within *Labordia;* that is, of retaining *L. Tinifolia* and its closer congeners as species of *Labordia* without sectional distinction from the other species. My own work convinces me that *Labordia* is a valid genus, and that *L. Tinifolia* and its closer allies belong to *Labordia,* although preferably as a distinct section. The two section names used by Baillon (*Rabdolia* and *Darbolia*) are withdrawn from *Geniostoma,* where they were placed by him, and used here under *Labordia* (*vide pp. 456 et 457*).

Genus **LABORDIA** Gaud.: Description

Gaudichaud, Voy. Freycinet Bot. 449. 1830.

Shrubs or small trees. Leaves opposite, entire or obscurely dentulate, obliquely pinnate-nerved, mostly petiolate; petioles in most species (*Labordiae verae* Hillebr.) basally more or less adnate to dorsal surface of axillary, sheathing, laterally somewhat or scarcely connate stipules. Inflorescence a terminal cyme (this simple or compound, corymbiform or paniculate or less often subumbellate) or in some cases reduced to a single flower; peduncle subtended by a pair of bracts, pedicels with small linear bractlets at about their middle. Flowers more or less dioecious, but seemingly dimorphic ordinarily only as to anthers and pistils.[1] Calyx persistent; sepals usually 5, more often connate, quincuncially imbricate in the bud, basally glandular on inner face, usually unequal in length and the outer ones commonly broadest. Corolla subcoriaceous, yellow or greenish; tube cylindrical; the usually 5 lobes narrow, acute, erect or spreading. Anthers 5, subsessile at sinuses of corolla-lobes, partly exserted, linear-oblong, acute, affixed dorsally at their middle or near their base, 2-celled; in pistillate flowers shorter, more slender, and apparently always sterile. Pistil (represented in staminate flowers by the pistillode) commonly surpassed by corolla-tube, its three parts usually well differentiated; ovary ovoid, incompletely 2-3-celled, the numerous ovules anatropous or nearly amphitropous and on thick, apparently axial placentas; style short and thick to long and slender, straight or rarely bent or twisted; stigmas 2 or 3, erect, complanate or trigonous, commonly more or less coalesced into a short, frequently truncate, 2-3-lamellate, cephaloid body. Pistillode more slender and elongate than the corresponding pistil, its style often equaling or exceeding the corolla-tube, the stigmas more often connate or completely fused and appearing collectively more or less elongate-clavate. Fruit a capsule with thick exocarp, dehiscent from apex downward or from base upward or both ways, the ligneous or pergameneous valves, with part of the introverted dissepiments, breaking away from the finally free and pulpy placentas. Seeds small (±2-3 mm. long), ovoid, smooth, imbedded in an orange-colored or greenish pulp. Embryo straight-cylindrical, nearly as long as the fleshy albumen, the radicle little longer than the cotyledons and nearly as broad.[1]

---

[1] As to an apparent exception, see under *Labordia Tinifolia var. γ leptantha,* p. 534.

CONSPECTUS OF SECTIONS

Labordia sect. **Rabdolia** (Baill.) comb. nov.; *Geniostoma* sect. *Rabdolia* Baill. Bull. Soc. Linn. Paris 1: 239. 1880; *Labordia* sect. *Labordeae verae* Hillebr. Fl. Haw. Isls. 288. 1888.

Innovations from the uppermost axils below the inflorescence, therefore the branches dichotomous, enclosing between them the old fruits. Branchlets mostly subangular to angular or even alate, the leaves crowded near their ends. Stipules intrapetiolar, usually 2-5 mm. tall, more or less auriculiform and dorsally adnate to the petiolar base, laterally somewhat connate. Flowers solitary or more often cymosely disposed; cyme variously subumbellate to shortened-corymbiform or very rarely paniculate, but usually sessile or nearly so (pedunculate in *L. pedunculata*). Calyx divided almost or commonly all way to base into lobes or sepals, these unequal, the outer ones in some species and varieties more or less foliaceous. Corolla orange-colored or yellow or rarely (*L. Cyrtandrae*) pale greenish-yellow, the apices of its long-acuminate lobes patent or more rarely appressed in the bud; mature pistil entire at top or but slightly cleft. Capsule 2- or 3-valved, the valves woody. Nos. 1–18.

---

[1] Description modified from that by Hillebrand, Fl. Haw. Isls. 288. 1888.

Labordia sect. **Darbolia** (Baill.) comb. nov.; *Geniostoma* sect. *Darbolia* Baill. Bull. Soc. Linn. Paris 1: 239. 1880; *Labordia* sect. *Geniostomoides* A. Gray, Proc. Amer. Acad. 4: 322. 1860; *Labordia* sect. *Geniostomoideae* Hillebr. Fl. Haw. Isls. 289. 1888.

Innovations not confined to uppermost axils. Branchlets terete or rarely angular especially toward apex, pale, with leaves distant. Stipules low-annular, rather interpetiolar, not forming a rising auricle inside the petiole. Cyme pedunculate, simple or paniculate. Calyx small, 5-fid with equal or subequal narrow lobes. Corolla slender, hypocrateriform, greenish, its lobes closed to the apex in the bud; mature pistil entire at top or but slightly cleft. Capsule mostly 2-valved, valves pergameneous. Nos. 19–23.

CONSPECTUS OF SPECIES, VARIETIES, AND FORMS

PAGE
1. *Labordia molokaiana* 464
  var. β *lophocarpa* 466
  var. γ *Munroi* 467
  var. δ *phyllocalyx* 468
  var. ε *congesta* 470
  var. ζ *setosa* 470
  var. η *Bryanii* 471
2. *Labordia Fagraeoidea* 472
  var. β *Humei* 474
    f. 1. *paniculata* 476
  var. γ *conferta* 476
  var. δ *jugorum* 477
  var. ε *sessilis* 478
    f. 1. *glabrescens* 481
  var. ζ *waianaeana* 482
  var. η *Saint-Johniana* 483
  var. θ *longisepala* 483
  var. ι *septentrionalis* 484
  var. κ *Hillebrandii* 484
    f. 1. *subcalva* 485
  var. λ *simulans* 486
3. *Labordia pallida* 486
  var. β *hispidula* 488

4. *Labordia pedunculata* 488
5. *Labordia pumila* 489
6. *Labordia Hedyosmifolia* 491
   var. β *centralis* 494
   var. γ *Rockii* 496
   var. δ *robusta* 496
   var. ε *Grayana* 497
   var. ζ *Skottsbergii* 498
   var. η *kilaueana* 499
   var. θ *magnifolia* 499
   var. ι *Hosakana* 500
7. *Labordia venosa* 502
8. *Labordia Wawrana* 503
9. *Labordia mauiensis* 504
10. *Labordia glabra* 504
   var. β *orientalis* 505
   var. γ *latisepala* 506
11. *Labordia Cyrtandrae* 506
   var. β *nahikuana* 509
12. *Labordia Baillonii* 510
13. *Labordia membranacea* 511
   var. β *exigua* 512
14. *Labordia Degeneri* 513
   var. β *subcarinata* 514
15. *Labordia olympiana* 515
16. *Labordia hirtella* 516
   var. β *microphylla* 518
   var. γ *sororia* 519
   var. δ *microcalyx* 519
   var. ε *haleakalana* 520
   var. ζ *hispidior* 521
   var. η *laevis* 521
   var. θ *imbricata* 521
   var. ι *laevisepala* 522
17. *Labordia waialealae* 522
18. *Labordia Lydgatei* 525
19. *Labordia Helleri* 526
   var. β *macrocarpa* 526
20. *Labordia triflora* 528
21. *Labordia Tinifolia* 529
   var. β *parvifolia* 532

var. γ *leptantha* 533
var. δ *waialuana* 534
var. ε *lanaiensis* 535
var. ζ *Euphorbioidea* 536
var. η *Forbesii* 536
var. θ *microgyna* 537
var. ι *tenuifolia* 537
var. κ *honolulensis* 538
22. *Labordia kaalae* 538
var. β *Fosbergii* 539
var. γ *brachypoda* 540
var. δ *mendax* 541
var. ε *kauaiensis* 541
23. *Labordia decurrens* 542

KEY

a. Leaf-blades appressedly hispidulous beneath with dark-rufous setulae.

  b. Capsular valves distinctly carinate toward apex even in young capsule . . . . 13. *L. membranacea* and var. β *exigua.*

  b. Capsular valves ecarinate . . . . 15. *L. olympiana.*

a. Leaf-blades otherwise.

  b. *Leaf-veins all or all but the largest completely covered on salient lower surface with densely matted, short, sharp, arcuate setulae, these concealing the veins to a lens;* inflorescence sessile, compact, 10–30-flowered; plant native of northeastern East Maui . . . . 7. *L. venosa.*

  b. Leaf-veins glabrous beneath or more loosely and openly setulose.

    c. Capsular valves 2 (about 12–13 mm. long), *longitudinally and reticulately veined on outer surface;* inflorescence paniculate-cymose, ±25-flowered; calyx glabrous, about 2 mm. tall, lobes ovate-cordate, at margin conspicuously straw-yellow, at base more or less auriculate; plants native of Kauai. 18. *L. Helleri* and var. β *macrocarpa.*

    c. Capsular valves not reticulately or longitudinally veined on outer surface.

      d. Capsule globose, smooth, ecarinate, 2-valved, *only about 4 mm. thick;* cyme open, delicate, 6–21-flowered, its branches capillary; calyx glabrous, about 2 mm. tall; plant native of southernmost Kauai . . . . 19. *L. Lydgatei.*

d. Capsule much exceeding 4 mm. in thickness.

e. Branchlets angular with leaves crowded near their ends; innovations from the uppermost axils below the inflorescence, the branches thus dichotomous; stipules intrapetiolar (forming an erect auricle inside the petiole); calyx divided to the base into unequal lobes or sepals, the outer ones often foliaceous; corolla yellow, the apices of its long-acuminate lobes patent in the bud; capsular valves woody.

f. Principal leaves large, their blade usually 1–2 dm. long.

g. Branchlets mostly sterile or at most with abortive flowers and manifestly teratological.

2. *L. Fagraeoidea* var. *ε sessilis.*

g. Branchlets normally floriferous.

h. Leaves oblong-oblanceolate, 3–6 cm. wide, gradually narrowed into a margined petiole (this commonly under 1 cm. long), ±20 principal lateral veins to each side; corolla externally white-hispid; plant native of Kauai.

8. *L. Wawrana.*

h. Leaves obovate-oblong, 3–6 cm. wide, attenuate at both ends, petiole slender and 1–2.5 cm. long, 7–10 principal lateral veins to each side; plant native of Kauai.

3. *L. pallida* var. *β hispidula.*

h. Leaves broadly and at times somewhat obovately elliptic to ovate-elliptic, 2–14.5 cm. wide, moderately or broadly cuneate at base (petiole 1–5 cm. long), principal lateral veins 7–13 to each side; corolla externally glabrous or slightly pilosulous; plants natives of Oahu and northeasternmost East Maui.

11. *L. Cyrtandrae* and var. *β nahikuana.*

f. Principal leaves smaller, their blade usually less than 1 dm. long.

g. Calyx-lobes usually 0.3–0.6 the length of the corolla-tube; capsular valves ecarinate.

h. Inflorescence sessile or nearly so.

16. *L. hirtella* and vars.

h. Inflorescence pedunculate with a peduncle ±2 cm. long........................4. *L. pedunculata.*

g. Calyx-lobes at least as long as the corolla-tube.

h. Flowers single, rarely three.[1]

i. *Corolla enclosed entirely within the foliaceous calyx-lobes or sepals;* capsular valves carinate.
1. *L. molokaiana* and vars.

i. Corolla proportionately larger, its tube alone equaling the lanceolate calyx-lobes.
10. *L. glabra* and vars.

h. Flowers several or many.

i. *Pistil lacking a style;* leaves very glabrous, the lower surface (at least when dry) pale and glaucescent and beautifully arcuate-penninervate with much darker nerves; capsule ovoid-trigonous, 12–13 mm. long; plant native of northwestern Kauai.........5. *L. pumila.*

i. Pistil with a manifest style.

j. *Capsule 2–3 cm. long,* 2-valved, compressed or obcompressed, valves medianly more or less carinate (unless toward base) but not cristate; plants native of western Kauai.
14. *L. Degeneri* and var. *β subcarinata.*

j. Capsule smaller.

k. Leaf-blades usually 1–2.5 cm. long and with 3 or 4 principal lateral nerves to each side, marginally more or less revolute, with nerves often salient beneath; occasionally (especially on sterile shoots) even 5–7 cm. long and 3–4 cm. wide, more numerously nerved, but still often revolute; plant native of northwestern Kauai and possibly southeastern Molokai....................17. *L. waialeale.*

k. Leaf-blades otherwise.

---

[1] As Hillebrand very properly observes, "It often happens that of several flowers only one arrives at maturity; therefore it is not safe to infer from the presence of a single capsule the character of the inflorescence." (Fl. Haw. Isls. 289, footnote. 1888.)

Moreover, it may be remarked that certain species of the next group (e.g., *L. Fagraeoidea*) have at times branchlets terminated with only 1 or 2 flowers and so might seem to belong here.

l. Pistillode slenderly clavate, its elongate-obconic stigma gradually passing into and scarcely distinguishable from the style.

  m. Leaf-blade 6–11 cm. long and 2–3.5 cm. wide; plant native of Kauai. 3. *L. pallida.*

  m. Leaf-blade 3–6.5 cm. long and 8–15 mm. wide; plant native of north-eastern East Maui . 9. *L. mauiensis.*

l. Pistillode more or less clavate but its stigma not obconic and not distinguishable with difficulty from the style.

  m. Calyx-lobes or some of them usually reaching or exceeding lowest sinuses between corolla-lobes, i. e., equaling the corolla-tube.

    n. Flowers usually in subumbellate cymes; leaves pale beneath or even on both surfaces; capsule usually globose-ovoid; plants natives of Oahu.

      o. Leaf-blades short-ovate to obovate, conspicuously salient-nerved beneath, often revolute; sepals elongate, linear-oblong or linear-subulate, frequently ciliate . . . . . 6. *L. Hedyosmifolia* var. *θ Hosakana.*

      o. Leaf-blades commonly somewhat narrower, the nerves scarcely or not at all salient beneath, margins rarely revolute; sepals often broader. 2. *L. Fagraeoidea* and vars.

    n. Flowers usually in large, open, compound, corymbiform cyme (but in certain varieties and forms closely aggregated); leaves not pale beneath (unless on plants

from Island of Hawaii); capsule conic-ovoid.
6. *L. Hedyosmifolia* and vars.

m. Calyx-lobes usually shorter than corolla-tube; leaf-blades firm-chartaceous, elliptic-ovate, mostly 7–10.5 cm. long and 3.2–5.8 cm. wide; plant native of Hawaii . . 12. *L. Baillonii.*

e. Branchlets terete, pallid, with leaves distant; stipules low-annular, interpetiolar; calyx minute, 5-fid with equal lobes; corolla greenish, slender, salver-shaped, its lobes closed to the apex in the bud; capsular valves pergameneous.

f. Leaves (at least principal ones) basally subtruncate to cordate.

g. Branchlets (including those of inflorescence) and lower leaf-surfaces tomentulose or hispidulous; plant native of Oahu . . . . 22. *L. kaalae.*

g. Branchlets (including those of inflorescence) glabrous or glabrate or at most papillate.

h. Leaves terminally narrowed and acuminate; cyme 3-flowered; plant native of southeasternmost Molokai . . . . 20. *L. triflora.*

h. Leaves terminally broad or almost subrotund, at apex itself abruptly subacute; cymes mostly 5–many-flowered; plants natives of Oahu.
22. *L. kaalae* vars.

f. Leaves basally contracted.

g. Blades of principal leaves mostly 1–1.8 dm. long, gradually narrowed below middle to the more or less decurrent base, very membranaceous; median vein flat and about 1.5 mm. wide; petiole flat or toward base conduplicate, 1–2.5 cm. long; plant native of Oahu . . . . 23. *L. decurrens.*

g. Blades of principal leaves mostly under 1 dm. long; usually not or at least less gradually narrowed below middle, not or but slightly decurrent on petiole; median vein inconspicuous or rounded-salient but under 1 mm. wide; petiole thickish and more terete . . . . 21. *L. Tinifolia* and vars.

ABBREVIATIONS USED FOR HERBARIA CITED

Berl.	Herb. Berlin Botanical Garden, Berlin-Dahlem.
Bish.	Herb. Bernice P. Bishop Museum, Honolulu.
Brit.	Herb. British Museum of Natural History, South Kensington.
Corn.	Herb. Cornell University, Ithaca.
Deg.	Herb. of Otto Degener, Honolulu.
Del.	Herb. Delessert, Geneva.
Field	Herb. Field Museum of Natural History, Chicago.
Flor.	Herb. Institute of Botany, University of Florence, Italy.
Goth.	Herb. Arboretum Gothenburg, Sweden.
Gray	Herb. Gray, Harvard University, Cambridge, Massachusetts.
Kew	Herb. Royal Botanic Gardens, Kew.
Minn.	Herb. University of Minnesota, Minneapolis.
Mo.	Herb. Missouri Botanical Garden, St. Louis.
Mun.	Herb. Munich Botanical Garden, Germany.
Mus. V.	Herb. Museum of Natural History, Vienna.
N. Y.	Herb. New York Botanical Garden, New York City.
Par.	Herb. Museum of Natural History, Paris.
Petrop.	Herb. Botanical Garden of Leningrad (Hortus Petropolitanus), U.S.S.R.
Phila.	Herb. Philadelphia Academy of Natural Sciences, Philadelphia.
U. S.	Herb. United States National Museum, Washington.

1. **Labordia molokaiana** Baillon, Bull. Soc. Linn. Paris 1:240. 1880; cf. St. John, Occas. Paps. Bish. Mus. 12: no. 8: 7, *pl. 3*, 1936; *Labordia lophocarpa* var. *pluriflora* Hillebr. Fl. Haw. Isls. 290. 1888.

a. Ultimate branchlets very setulose.
  b. Leaves often over 8 cm. long; plant of Molokai. *L. molokaiana sensu stricto.*
  b. Leaves seldom over 7 cm. long; plant of Lanai. var. γ *Munroi.*
a. Ultimate branchlets smooth or scabrous but not or only very slightly setulose.
  b. Sepals externally glabrous or slightly setulose.
    c. Outer sepals (1.4–2 cm. long) moderately narrowed at base (plant of Molokai)...................... var. β *lophocarpa.*

c. Outer sepals more or less stipitate at base.

d. Outer sepals becoming 2–3.2 cm. long; plant of Oahu. var. δ *phyllocalyx.*

d. Outer sepals under 1.8 cm. long; plant of Molokai. var. ε *congesta.*

b. Sepals externally hispid.

c. Leaves sharply acuminate; branchlets subterete to weakly angulate; plant of Oahu.................. var. η *Bryanii.*

c. Leaves subacute to barely acuminate; branchlets subalately tetragonal; plant of Molokai................ var. ζ *setosa.*

A much branching shrub, glabrous except for the younger branchlets (these slender, sharply ridged or angular, the last 1–3 internodes shaggy-setulose) and for the sparsely (or on veins moderately) appressed-setose lower surfaces of the leaves. Stipular sheath large, laterally emarginate. Leaves gradually narrowed from middle or from upper third into a slender or slightly margined petiole, this 0.8–1.5 or even to 2.4 cm. long; blade oblong-oblanceolate to narrowly obovate, apically acuminate, membranaceous, on principal leaves now 7–9 cm. long and 2–3.3 cm. wide (as in type) now even 10–15 cm. long and 3–4.6 cm. wide (as in type of *L. lophocarpa* var. *pluriflora* Hillebr.). Inflorescence of 1–3 often nodding flowers on subappressedly setulose pedicels 8–12 mm. long, bractlets linear or spatulate. Sepals distinctly acuminate, outer ones broadly ovate. Capsule obovoid-globose, 3-valved; valves medianly carinate above, ±1.3 cm. tall.

Type specimen: Collected by *Jules Remy,* no. 363, Molokai, 1851–1855 (Par.).

Distribution: Molokai.

Specimens examined: *Charles N. Forbes* 503–*Mo,* Halawa, September, 1912 (Bish.; with a single flower, this eaten out by insects); *Dr. William Hillebrand,* same locality (Berl.; type of *Labordia lophocarpa* var. *pluriflora* Hillebr.; fruiting); *Remy* 363 (type, Par.; sterile).

St. John (op. cit. 9) compared the type of *L. molokaiana* (Par.) with an isotype of *L. lophocarpa* Hillebr. (Kew) and found them "inseparable." *As to species,* they are indeed the same. A study, however, of the several sheets of Hillebrand's original Molokai material of *L. lophocarpa* (Berl.) and of various specimens of *L. lophocarpa* collected more recently, shows that *L. lophocarpa* as it occurs on Molokai differs consistently in having the terminal internodes of the branchlets practically or absolutely devoid of hispidity. The type of *L. molokaiana* (now before me) on the contrary has its branchlets abundantly setulose on the terminal internodes. Hillebrand was unfamiliar with Baillon's name and so, in describing *L. lophocarpa,* based the species proper upon the plants with glabrous branchlets, since these were apparently of the more widely distributed form and better known to him. He did, however, describe a var. *pluriflora* from Halawa, on Molokai, and his type of that variety (now before me) is seen to have the branchlets setulose toward the ends, as in the type of *L. molokaiana.*[1] It is a fruiting specimen, with leaves fewer than and twice as large as in the Remy plant, but in the absence of further evidence may well be considered identical, especially since such a range in leaf size is not uncommon within single varieties of *Labordia.*

The Molokai material of *L. lophocarpa* Hillebr. is seen to merit varietal rank under *L. molokaiana* (see var. *lophocarpa*). The Lanai material, of which several fine specimens have been seen, is fairly easy to distinguish from all the Molokai plants and is here treated under the var. *lanaiensis.*

Labordia molokaiana var. β **lophocarpa** (Hillebr.) Sherff, Amer. Journ. Bot. 25: 585. 1938; *Labordia lophocarpa* Hillebr. Fl. Haw. Isls. 289. 1888 (exclud. Lanai plants).

Younger branchlets fleshy but soon becoming rigid and more or less subalate-tetragonal, perhaps more foliose. Leaf petiole 4–15 mm. long; blade shortly acuminate at apex, gradually or subabruptly narrowed below, usually drying dark especially upon upper surface, commonly glabrous, 5–11 cm. long and 2–4 cm. wide. Inflorescence a single terminal flower or at times 3-flowered; pedicel puberulous, 4–10 mm. long; bractlets lanceolate or spatulate, about 1.2 cm. long. Calyx as long as corolla; sepals 4 or 5, distinct, broad and foliaceous, 1.4–2 cm. long (outer ones rounded, nearly as broad as high, shortly acuminate, 9–11-nerved; inner ones less than half as broad as high). Corolla deep yellow, enclosed in the calyx, externally glabrous, internally puberulous, its thick tube 10–12 mm. long, the lobes (often 6 or 7 in number) 6–8 mm. long. Style of fertile flowers about 4 mm. long, shorter than the broad, clavate stigma. Capsule (including crests) 1.2–1.4 or even up to 2.4 cm. tall, 2- or 3-valved, almost globose when 3-valved but complanate when 2-valved, the valves conspicuously carinate or crested above, the crests rounded and generally not confluent at apex.

---

[1] Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 157. 1936) states: "The reasons for an identification [of *L. molokaiana* with *L. lophocarpa*] appear, however, to be weak; from a comparison between the statements made by Baillon and Hillebrand's good description, it is evident that the leaves must be quite different, narrow lanceolate in the former, elliptic to obovate-oblong in the latter. *L. molokaiana* has a few-flowered, contracted cyme, *L. lophocarpa* single terminal flowers." St. John (Occas. Paps. Bish. Mus. 12: no. 8: 9. 1936) quotes Skottsberg but concludes nevertheless that the differences emphasized by Skottsberg "are rather in terminology than in morphology. In both the leaves are oblanceolate and the flowers single and terminal." The differences cited by Skottsberg are, however, real. It may well be true, of course, that the single type specimen of *L. molokaiana* now has only one flower for an inflorescence. Indeed, the type seems now entirely to lack well developed flowers. But, notwithstanding this purely negative evidence, we have Baillon's original description: "Ses inflorescences sont contractées et pauciflores." Moreover, that the form of plant described by Baillon does at times have more than one flower to a single inflorescence, as implied in Baillon's "pauciflores," is confirmed in Hillebrand's description for the identical var. *pauciflora* ("Inflor. of 1–3 often nodding flowers") and in Hillebrand's prior use, on a field label for the type of his var. *pluriflora*, of the varietal name *triflora* (to distinguish it from the species which Hillebrand afterwards named *lophocarpa* but at the time designated, in pencil, *uniflora*).

Type specimen: Hillebrand named Molokai first (i.e., before Lanai) and cited his own specimens from Kalae, Wailau, and Mapulehu. A sheet of material from each of these three localities is extant in fine condition (Berl.). The Kalae specimens were collected in June, 1870.

Distribution: Eastern and north-central Molokai.

Specimens examined: *Otto Degener* 10,275, growing 5 feet tall, flowers orange, on sunny, shrub-covered, damp slope, west of Pepeopae, April 12, 1928 (Deg.; Field; staminate); *Degener* 10,276, east of Pepeopae, May 9, 1928 (Field; pistillate); *Degener* 10,281, Kaluaaha rain-forest, June 28, 1928 (Berl.; Deg.; Field; subflowering); *Charles N. Forbes* 138-*Mo*, mountains above Puu Kolekole, June, 1912 (Berl.; Bish.; Field; Kew; flowering); *Forbes* 168-*Mo*, same locality and date (Field; fruiting); *Forbes* 291-*Mo*, Pukoo, July, 1912 (Bish.; flowering); *Forbes* 332-*Mo*, Wailau Trail, August, 1912 (Bish.; Field; sterile); *William Hillebrand*, Hawaiian Isls. (Mus. V.; flowering); Hillebrand, Valley of Mapulehu (Berl.; Petrop.; flowering and fruiting); *Hillebrand*, Pali of Wailau (Berl.; sterile); *Hillebrand*, Kalae, June, 1870 (Berl.; type; flowering); *George C. Munro* 572, above Waikolu, June 5, 1916 (Bish.; flowering); *Joseph F. Rock* 7,044, alt. 3,000 feet, Pali of Wailau, April 15, 1910 (Bish.; subflowering); *Rock* 12,577, Mapulehu Mts., May 6, 1915 (Bish.; flowering); *Rock* 16,015, Kamoku, April, 1918 (Bish., 2 sheets; flowering); *Rock* 17,136, Mapulehu, Wailau Pali, May 6, 1915 (Bish., 2 sheets; flowering).

Labordia molokaiana var. γ **Munroi** Sherff, Amer. Journ. Bot. 25: 585. 1938; *Labordia lophocarpa* Hillebr. Fl. Haw. Isls. 289. 1888 (only as to Lanai specimens).

Ultimate branchlets densely aciculate-setulose on terminal few internodes. Leaves small, mostly narrow-obovate, apically short-acuminate, appressed-setose underneath; petiole broad or narrow, under 8 mm. long; blade 3.5–6 (rarely to 7.5) cm. long and 1–4 cm. wide. Inflorescence 1–3-flowered; corolla externally hispidulous, the tube often densely and conspicuously so.

Type specimen; Collected by *Dr. William Hillebrand,* Lanai, July, 1870 (Berl.).

Distribution: Mountains of eastern Lanai.

Specimens examined: *Charles N. Forbes* 27–*L*, mountains near Koele, June, 1913 (Bish.; flowering); *Forbes* 206–*L*, same locality and date (Bish.; Field; flowering); *Forbes* 242–*L*, mountains, east end of Lanai, June, 1913 (Bish.; flowering); *Hillebrand,* Lanai, July, 1870 (type, Berl.; fruiting); *George C. Munro* 229, Lanaihali, May 17, 1914 (Bish.; flowering); *Munro* 413, same locality and date (Bish.; flowering); *Munro* 449, ridge below Lanaihali, May 17, 1915 (Berl.; Bish.; Field; flowering).

The variety was named for Mr. George C. Munro, of the Island of Lanai, in grateful recognition of the valuable services he has performed for students of the Hawaiian flora by his numerous collections of Hawaiian plants.

Labordia molokaiana var. *δ* **phyllocalyx** (Hillebr.) Sherff, Amer. Journ. Bot. 25: 585. 1938; *Labordia waiolanii* Wawra, Flora 55: 516. 1872 (and Skottsberg, Meddel. Göteborgs Bot. Trädgård 10: 154, *fig. 18.* 1936); *Labordia lophocarpa* var. *phyllocalyx* Hillebr. Fl. Haw. Isls. 290. 1888.

Small, sparingly branched shrub, branchlets commonly glabrous or glabrate to end. Stipules broad-auricular, distinct. Leaves succulent when fresh, membranaceous when dry, subsessile; petiole 2–4 mm. long; blade variously obovate to elliptic or oblanceolate, at apex moderately or sometimes very acuminate, below middle usually narrowed to an acute base, glabrous or sometimes very sparsely setose or papillate-hirtellous beneath, 4–6 (rarely to 7.5) cm. long and 1.5–3 cm. wide. Cyme 1–3-flowered, pedicels very short or up to 8 mm. or finally often 1.5 cm. long, glabrous or at first sparsely setulose. Sepals large, foliaceous, thick, stipitate at base, the 3 outer ones cordate-ovate, short-acuminate, 2–3.2 cm. long and 1.3–2 cm. wide; the two inner ones ovate-lanceolate, ±2 cm. long and about 7–10 mm. wide. Corolla ±2.5 cm. long; tube ±13 mm. long, thin below but fleshy above, sparsely pubescent outside, slightly hairy above on inside; lobes spreading, fleshy, hirsute except toward apex, ±12 mm. long and ±5 mm. wide. Anthers of fertile flowers linear-sagittate, mucronulate, 2.5–2.7 mm. long (including mucro of 0.5 mm.) and 0.6 mm. wide, sterile; or at times apparently lacking. Pistil ±1.4 cm. long; ovary ovoid-cylindric from truncate base, glabrous, trisulcate, trimerous, 7–8 mm. long and 3 mm. wide; style almost lacking, stigmas 3, erect, 6 mm. long and 1.5 mm. wide, canaliculate. Sterile flowers not seen. Capsule about 15 mm. tall (or about 12 mm. excluding the crested, valvular keels); pulp orange-colored when fresh.

Type specimen: Collected by *Dr. William Hillebrand,* western ridge of Nuuanu, Oahu, December, 1869 (Berl.).

Distribution: Southeastern and northeastern Oahu.

Specimens examined: *Otto Degener* (field no. 302), Oahu, July 29, 1935 (Berl.; Deg.; Field; flowering and fruiting); *Degener & Emilio Ordoñez* 12,062, in rain-swept, shrubby place, along C. C. C. Trail, Kawailoa, July 3, 1938 (Berl.; Field; subflowering); *Degener & Ordoñez* 12,063, on rain-swept, shrubby summit, same locality and date (Deg.; Field; pistillate); *Degener, Park, Bush, & Potter* 10,151, in rain-forest, west of Poamoho Trail, Laie, August 25, 1935 (Field; subfruiting); *Degener, Park, Bush, Potter, & Topping* 10,120 *pro parte,* a slender tree 12 feet tall, in forest, Anahulu Trail, Koolau Range, June 16, 1935 (Field, 2 sheets; *cum L. Fagraeoidea var. septentrionali commixt.*); *Degener, Salucop, & Arlantico* 11,568, tree 5–8 feet tall, in forest, alt. 3,000 feet, southeast slope of Puu Kaala, December 19, 1937 (Berl.; Deg.; Field; fruiting); *Francis R. Fosberg* 9,738, flowers deep yellow, on wooded ridge, alt. 850 meters, Kipapa Gulch, Waipio, August 6, 1933 (Field; subflowering); *Hillebrand,* western ridge of Nuuanu, December, 1869 (type, Berl.: cotype, U. S.; fruiting); *E. Y. Hosaka* 678, tree 10 feet tall, on denuded ridge, alt. 2,500 feet, south ridge, Kipapa Gulch, Waipio, Koolau Mts., July 4, 1932 (Bish.; pistillate); *Rock & Shaw,* Konahuanui, September, 1912 (Bish.; flowering); *Carl Skottsberg* 1,850, alt. about 750 meters, Koolau Range, high ridge above Kahana, September 17, 1926 (Bish.; Goth.; pistillate); *Michio Yamaguchi* 1,256 *pro parte,* alt. 2,700 feet, south ridge, Kipapa Gulch, Waipio, Koolau Range, July 4, 1932 (Bish.; Field; subflowering; *cum L. Fagraeoidea var. conferta commixt.*).

Joseph F. Rock made a study of *Labordia molokaiana* Baill. and *L. waiolanii* Wawra in 1914. Under date of April 6th of that year he wrote a label at Berlin (for the Rock & Shaw specimen now at

Bishop Museum), transferring *L. waiolanii* to varietal status under *L. molokaiana.* Rock's interpretation of *L. waiolanii* appears to be the only logical one, but under the International Rules the name *phyllocalyx,* which is synonymous with *waiolanii,* must be adopted.

Hillebrand (Fl. Haw. Isls. 290. 1888), clearly by way of mere speculation and without Wawra's material at hand, reduced *L. waiolanii* Wawra to synonymy with *L. Fagraeoidea* Gaud., although he had previously stated his own var. *phyllocalyx* to be "possibly Wawra's *L. Waiolanii* on the improbable assumption that the foliaceous sepals had been mistaken for a 'rosette of leaves.' " Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 155. 1936) reports having "examined *Wawra's* type which shows that *Hillebrand's* assumption, though improbable, was correct." Skottsberg maintains *L. waiolanii* as a species and to it refers his own no. 1850, a plant which matches the type of Hillebrand's var. *phyllocalyx.*

Labordia molokaiana var. **ε congesta** Degener & Sherff *ex* Sherff, Amer. Journ. Bot. 25: 585. 1938.

Branchlets often tetragonal, even subalate at the angles. Leaves numerous and crowded together, pallid, shortly petiolate, petiole 2–6 mm. long; blade oblong-ovate or at times obovate, at apex acute but hardly acuminate, glabrous, 2–6 cm. long and 1–3 cm. wide. Exterior sepals broadly ovate, at base more or less auriculate-cordate and broadly substipitate, dorsally glabrate, more often 1–1.5 cm. long. Bractlets spatulate. Corolla 1.3–1.5 cm. long, externally more or less pubescent, internally white-setose, tube ±7.5 mm. long, lobes oblong-linear.

Type specimen: Collected by *Otto Degener,* no. 10,278, head of Waihanau Stream, Molokai, May 23, 1928 (Field).

Distribution: Northeastern Molokai.

Specimens examined: *Degener* 10,278 (type, Field: cotypes, Berl.; Deg.; Gray; pistillate); *Degener* 10,279, near Lalanui, May 18, 1928 (Berl.; Deg.; Field; Gray; flowering).

This and var. *setosa* may be distinguished from *L. molokaiana* proper and its other varieties by their numerous, small, pale leaves, these much crowded toward the ends of the subalately tetragonal branchlets. The two varieties are too closely alike in foliage apparently to be recognized with certainty unless calyces are present.

Labordia molokaiana var. **ζ setosa** Degener & Sherff *ex* Sherff, Amer. Journ. Bot. 25: 585. 1938.

Strongly similar to var. *congesta* but differing at least in its sepals; these obovate, subgradually narrowed toward base (scarcely cordate or auriculate), on dorsal surface (below very densely, above moderately or sparsely) antrorse-hispid with brownish hairs, a little larger than in var. *congesta*.

Type specimen: Collected by *Otto Degener*, no. 10,282, in tapestry forest near top, west side of Waikolu Valley, Molokai, April 21, 1928 (Field).

Distribution: Known only from type locality in northeastern Molokai.

Specimens examined: *Degener* 10,282 (type, Field: cotypes, Berl.; Brit.; Field, 2 sheets; Gray; Kew; Par.; U. S.; flowering).

Labordia molokaiana var. η **Bryanii** Sherff, Amer. Journ. Bot. 25: 585. 1938.

Branchlets weakly or almost tetragonal, glabrous. Petioles 1–8 mm. long; blades oblanceolate, at apex clearly acuminate, at base gradually narrowed, glabrous on upper surface, moderately appressed-hispid beneath. Inflorescence more often 3-flowered. Calyx subsessile or finally short-pedicelled; sepals broadly ovate, lengthwise 5–9-nerved, on dorsal surface densely or at last moderately or even subsparsely hispid, 1.5–2.5 cm. long. Capsule about 1.8 cm. tall including the conspicuous crests.

Type specimen: Collected by *Francis Raymond Fosberg*, no. 10,965, bush 2 meters tall, flowers orange-yellow, leaves pale beneath, on wet, brushy ridge, alt. 880 meters, main divide north of Palikea, Waianae Mts., Honouliuli, Oahu, June 30, 1935 (Bish.).

Distribution: Waianae Mts., Oahu.

Specimens examined: *Fosberg* 10,965 (type, Bish.: cotype, Field; flowering); *Edward P. Hume* 42, near spring, on wet, steep slope, alt. 3,800 feet, Kaala, Waianaeuka, November 31, 1930 (Bish.; fruiting); *Olof H. Selling* 3,954, Waianae, Kaala, September 25, 1938 (Goth.; pistillate); *Harold St. John* 12,214, shrub 15 feet tall, moist woods near summit, alt. 3,050 feet, Puu Kaua, Honouliuli, November 6, 1932 (Berl.; Bish.; Field; fruiting); *D. LeRoy Topping* (*Otto Degener* distrib.) 2,859, Kalena, September 14, 1924 (Deg.; Field; flowering).

Named for Mr. Edwin H. Bryan, Jr., Curator of Collections at the Bernice P. Bishop Museum, to whom I was indébted for the lending of the first three collections cited, as well as of much other material from the Bishop Museum.

2. **Labordia Fagraeoidea** Gaud. Bot. Freyc. Voy. 450, *pl. 60.* 1830.[1]

a. Calyx lobes mostly lanceolate to oblong-lanceolate or oblong-linear.

b. Distal one or more internodes of branchlets hispid.

c. Distal one or two internodes moderately hispid; sepals glabrous or glabrate, about twice as long as corolla-tube. var. θ *longisepala.*

c. Distal few internodes densely hispid; sepals dorsally pubescent, equaling or shorter than corolla-tube. . . var. ε *sessilis.*

b. Distal internodes of branchlets glabrous or glabrate.

c. Calyx externally hispid at least on lower half.

d. Leaves membranaceous. . . . . .var. ζ *waianaeana.*

d. Leaves coriaceous. . . . . .var. κ *Hillebrandii.*

c. Calyx externally glabrous or at most with a few scattered setae near base.

d. Inflorescence usually teratological and abortive, leaves commonly elongate. . . . . .var. ε *sessilis* f. 1. *glabrescens.*

d. Inflorescence normal and productive.

e. Branchlets more or less terete; principal leaves oblong or oblong-ovate or -obovate, about 3–4 cm. wide, moderately appressed-hispid along veins on lower surface. *L. Fagraeoidea sensu stricto.*

e. Branchlets terete to obscurely tetragonal; principal leaves oblong-fusiform in outline or narrowly obovate, 2.5–3.5 cm. wide, glabrous beneath. var. ι *septentrionalis.*

e. Branchlets angular; principal leaves spatulate-oblanceolate, about 2–3 cm. wide, the veins on lower surface glabrous or at most very remotely setose. var. δ *jugorum.*

a. Calyx lobes (especially outer ones) ovate or broader.

b. Leaves mostly sessile, glabrous. . . . . .var. γ *conferta.*

b. Leaves mostly slender-petioled, often slightly hispid beneath.

c. Calyx strongly hispid at least below middle.

d. Leaves membranaceous. . . . . .var. η *Saint-Johniana.*

---

[1] In Gaudichaud's text proper, the trivial name was misprinted *fragraeoidea.* It was printed correctly as *fagraeoidea,* however, in the title to the illustrative plate (no. 60). The foliar habit resembles strikingly that of *Fagraea.*

d. Leaves coriaceous.................... var. κ *Hillebrandii.*

c. Calyx glabrous or very sparsely setose.

d. Inflorescence sessile, contracted and more or less umbellate.

e. Sepals up to 1.2 cm. wide, dorsally glabrous or sparsely setose below; leaves mostly narrow-obovate; plant of Waianae Range, Oahu.
var. κ *Hillebrandii* f. 1. *subcalva.*

e. Sepals mostly 5–7 mm. wide, dorsally more or less setose; leaves mostly oblong-fusiform; plant of Koolau Range, Oahu............................ var. λ *simulans.*

e. Sepals mostly 2–4 mm. wide, glabrous... var. β *Humei.*

d. Inflorescence pedunculate, open and paniculate.
var. β *Humei* f. 1. *paniculata.*

Shrub, branchlets terete or (because of decurrent leaf-petioles) angulate, somewhat appressed-hispid at nodes of younger portion, elsewhere glabrous. Leaves subsessile or petiolate; petiole sparsely hispidulous, 5–10 mm. long; blade oblong or oblongly ovate or obovate, at apex obtuse or more often moderately and subabruptly acuminate, at base widely cuneate, subcoriaceous, pinnately nerved (principal lateral nerves more often 10–12 to each side), very glabrous above, on lower surface along the nerves moderately elsewhere sparsely appressed-hispid with arcuate and sharp setae, very thinly hyaline and weakly revolute at the eciliate margin, for the principal leaves about 7–8 cm. long and about 3–4 cm. wide. Stipules dorsally adnate to base of petioles, connate or distinct, broadly indurate-margined and entire at top, about 3–4 mm. tall. Flowers few (±5) in a contracted, umbellate inflorescence. Calyx yellowish-green, 7–10 mm. tall; sepals 3- or 5-nerved, lanceolate or oblong-linear, delicately hyaline-margined, essentially glabrous, distinct nearly or quite to base, somewhat unequal in length, 1–2.5 mm. wide. Corolla yellowish-white, tubular-infundibuliform, ventricose at base, tube barely equaling the calyx; lobes lanceolate, spreading, somewhat villous on inner surface, ±6 mm. long. Pedicel slender, glabrous or essentially so, ±6 mm. long, bibracteolate at or near middle with extremely filiform, parallel-sided, glabrous bracteoles, these about 5 mm. long. Ovary ovate, trigonous, trilocular. Style short, thick, triangular. Stigma conic, triangular, pubescent. Mature capsule unknown.

Type specimen: Collected by *Charles Gaudichaud*, alt. 2,700–3,000 feet, Oahu, 1819. Represented by the original plate (Gaud., loc. cit.). The Museum of Natural History at Paris seems not to possess an authentic specimen among its Gaudichaud material. Fortunately, however, the Berlin Botanical Garden has, in a good state of preservation, an original specimen which Gaudichaud himself presented to Kunth in 1829. This is clearly from the type material, but the leaves (as can be seen in the photograph taken by me) are mostly a trifle broader toward the base than shown by the artist in the type illustration.

Distribution: Known only from Oahu. Hillebrand (Fl. Haw. Isls. 290. 1888) states that Gaudichaud probably collected his type in Nuuanu, southeastern Oahu.

Specimens examined: *Degener, Park, Potter, & Bush* 10,152, windswept summit, Kipapa Trail, Koolau Range, Oahu, June 2, 1935 (Field; staminate); *Gaudichaud,* alt. 2,700–3,000 feet, Oahu, 1819 (type material, Berl.; pistillate).

A species to which several other forms have been referred erroneously by various writers. I can find no specimens collected since Gaudichaud's time, except the lone Degener *et al.* plant, that match the type material. My description is in part borrowed from Gaudichaud's original text and illustration and in part taken from the single Gaudichaud specimen examined. It will be noted that Gaudichaud's description of this species as a "frutex glaber" is hardly accurate, since the lower leaf-surfaces and nodes of the young branchlets are more or less hispid. The Degener *et al.* plant, however, has these parts glabrous but possesses the slightest traces of hispidity on certain distal internodes.

Labordia Fagraeoidea var. β *Humei* Sherff, Amer. Journ. Bot. 25: 585. 1938.

Shrub ±3 meters tall; branchlets angulate, glabrous, at tips moderately or abundantly foliose. Leaves smaller and narrower; blade (often subrhomboidally or oblongly) oblanceolate, often narrowed slender-cuneately below the middle all the way to the base, coriaceous, glabrous or upon the more pallid lower surface often sparsely appressed-setulose, commonly 4–7 (more rarely –9.5) cm. long and 1–2.5 (more rarely –3) cm. wide; principal lateral nerves only about 7 or 8 to each side. Inflorescence sessile, umbellate, 2–5-flowered; bractlets of pedicels 2 or often only 1. Calyx lobes ovate or cordate-ovate, 2–6 mm. wide, glabrous, at apex acute or mucronate. Corolla fleshy, intensely yellow; lobes lanceolate-linear, spreading, internally white-setulose (especially below), at apex sharp, 7–12 mm. long; tube not surpassing the sepals, now glabrous now (more rarely) conspicuously and retrorsely white-setose. Capsule 3-valvate, glabrous, 1–1.2 (even 1.8–2.1) cm. long, globose-ovoid (or truly ovoid or obovoid); valves medianly carinate toward apex, moderately rostrate.

Type specimen: Collected by *Charles N. Forbes* (with *Mr. Labouchere*), no. 2,288–*O*, Kalihi Pali, Oahu, February 16, 1916 (Bish.).

Distribution: Along Koolau Range, Oahu.

Specimens examined: *H. F. Bergman*, alt. 1,700 feet, on slopes of Keeaumakua, February 22, 1928 (Bish.); *Otto Degener*, Oahu, July 29, 1935 (Field; staminate); *Degener, Martinez, & Salucop* 11,124, in rain-forest, Pig-God Trail, Punaluu, March 29, 1937 (Berl.; Brit.; Del.; Field, 2 sheets; Gray; Kew; Mo.; Mun.; Mus. V.; N.Y.; Par.; U.S.; variously staminate and fruiting); *Degener, Kwan Park, & Y. Nitta* 10,234, Pig-God Trail, in forest halfway to summit, Punaluu, June 22, 1932 (Berl.; Deg.; Field; Gray; Kew; Par.; partly typical and with mature fruits, partly teratological with monstrous ovate sepals 1–2 cm. long, these resembling those of *L. molokaiana* var. *phyllocalyx*); *Degener, Park, & Nitta* 10,235, in summit rain-forest, Pig-God Trail, Punaluu, June 22, 1932 (Berl.; Deg.; Field; fruiting); *Degener, Park, & Manuel Kwon* 10,238, in forest halfway to summit, Pig-God Trail, Punaluu, January 17, 1932 (Berl.; Deg.; Field; staminate); *Charles N. Forbes* (with *Dean Lake*) 1,980–*O*, Waimanu (Waimano) Ridge, October 27–30, 1914 (Bish.; sterile); *Forbes* 2,288–*O* (type, Bish.: cotypes, Berl.; Field; staminate); *Forbes & C. L. Thompson*, Koolau Mts. between Punaluu and Kaipapau, May 8–13, 1909 (Field; staminate); *Francis R. Fosberg* 10,896, corolla fleshy, deep chrome-yellow, leaves coriaceous, very pallid beneath, veins pellucid, on steep, bushy slope, alt. 740 meters, Waikane-Schofield Trail, Koolau Mts., Kahana, May 12, 1935 (Field; staminate); *F. R. & V. O. Fosberg* 13,736, shrub 3 meters tall, leaves thick, pallid beneath, veins pellucid, flowers fleshy, orange-yellow, in wet forest, alt. 650 meters, Castle Trail, Punaluu Valley, Koolau Mts., April 25, 1937 (Bish.; Field; staminate); *F. R. Fosberg & E. Y. Hosaka* 13,979, shrub 0.4 meter tall, leaves pallid beneath, main veins pellucid, corolla fleshy, orange-yellow, in small, open bog, alt. 825 meters, above Kaipapau Gulch, crest of Koolau Mts., May 31, 1937 (Field; staminate); *Edward P. Hume* 79, steep slope near top, alt. 600 meters, Punaluu, January 11, 1931 (Bish.; one of two corollas with tube conspicuously and retrorsely white-hispid outside; pistillate); *Hume* 439, shrub, alt. 1,800 feet, on side of wooded hill, Punaluu, Punaluu-Kaluanui Divide, December 21, 1931 (Bish.;

subflowering); *Harold St. John* 10,074, shrub, alt. 1,800 feet, Punaluu, November 30, 1929 (Berl.; Bish.; Field; staminate).

Easily distinguished from the species proper by its narrower, usually much smaller, basally more narrowly cuneate, apically more gradually narrowed leaves, these with fewer lateral nerves and the lower surface much less hispid or even glabrate. The sepals, too, are much broader proportionately and more ovate than in the species itself. The fruiting specimens examined have capsules mostly 1–1.2 cm. long, but a few capsules are found much longer. One collection (Degener *et al.* 11124) has, in addition to numerous small, mature capsules, a very few large, smooth, unmatured ones, ranging up to 2.1 cm. long, exclusive of the stylar rudiment (this about 4 mm. long).

Labordia Fagraeoidea var. β **Humei** f. 1. **paniculata** Sherff, Amer. Journ. Bot. 25: 586. 1938.

Inflorescence commonly 5- or 7-flowered, shortly pedunculate with a peduncle up to 6 mm. long, paniculate, ±2 cm. tall and ±3 cm. wide, branchlets (or pedicels) more or less opposite. Flowers a little smaller. Bractlets of pedicels more often only one.

Type specimen: Collected by *Charles N. Forbes*, no. 1,440–*O*, on ridge, east Nuuanu Valley, February 8, 1910 (Bish.).

Distribution: Southeastern Oahu.

Specimens examined: *Forbes* 1,440–*O* (type, Bish.: cotypes, Berl.; Field; Mo.; staminate).

The leaf-blades on the few specimens seen are mostly 2–5 cm. long. However, in the variety proper some material is found with leaf-blades averaging as small. Thus the paniculate, more numerously flowered, pedunculate inflorescence offers the only distinction. In view of the remarkably close resemblance in numerous other respects to specimens of the variety proper, collected in the same vicinity, this distinction would seem best considered as connoting a forma.

Labordia Fagraeoidea var. γ **conferta** Sherff, Amer. Journ. Bot. 25: 586. 1938.

Shrub ±1.5 meters tall; branchlets glabrous, sharply angulate (because of decurrent petioles). Leaves crowded near tips of branchlets, pallid, rarely subsessile commonly sessile, narrowly obovate or oblong-oblanceolate, at apex moderately acuminate, very glabrous; principal lateral nerves commonly 6–8 to each side. Inflorescence sessile, 3–5-flowered. Sepals ovate or widely oblong, normally 2–4.5 mm. wide (often monstrous and much larger). Corolla about 10–12 mm. long. Capsule 1.3 cm. long.

Type specimen: Collected by *Francis R. Fosberg* and *Edward Y. Hosaka*, no. 13,922, shrub 1.5 meters tall, leaves pallid beneath, main veins pellucid, on wet, brushy, windswept ridge, alt. 830 meters, crest of Koolau Mts., between Waikane Valley and Waikakalaua Gulch, May 30 and 31, 1937 (Field).

Distribution: In eastern Oahu.

Specimens examined: *Degener, Park, & Wallace Hirai* 10,237, in rain-forest, Waikane-Schofield Trail, April 4, 1931 (Deg.; Field; staminate); *Francis R. Fosberg* 8,714, bush 2 meters tall, in scrubby, wet forest, alt. 900 meters, summit of Koolau Mts., above Kipapa Gulch, Waipio, September 18, 1932 (Field; fruiting); *Fosberg* 10,896, corolla fleshy, deep chrome-yellow, leaves coriaceous, very pallid beneath, veins pellucid, on steep, brushy slope, alt. 740 meters, Waikane-Schofield Trail, Koolau Mts., Kahana, May 12, 1935 (Bish.; pistillate); *Fosberg & Edward Y. Hosaka* 13,922 (type, Field; subfruiting); *Hosaka* 946, shrub 4 feet tall, alt. 2,000 feet, on wet, denuded ridge, south ridge of Kipapa Gulch, Koolau Mts., March 19, 1933 (Bish.; Field; Par.; staminate); *Hosaka* 968, same locality, April 16, 1933 (Bish.; Field; staminate); *Hosaka* 2,033, shrub 3 feet tall, petals dark yellow, tube of corolla light yellow, common, on moist, wooded slope, alt. 2,000 feet, Waimano, Ewa Forest Reserve, Koolau Range, May 8, 1938 (Berl.; Bish.; Del.; Field; pistillate); *Hosaka* 2,034, same data (Bish.; Field; subflowering, pistillate); *Michio Yamaguchi* 1,256 *pro parte*, alt. 2,700 feet, same locality, July 4, 1932 (Bish.; Field; subflowering; *cum L. molokaiana var. phyllocalyce commixt.*). Several additional specimens have recently come to hand, but too late to include here.

The pale, terminally numerous leaves of the type offer an illusory resemblance to those of certain varieties (e.g., var. *moomomiana*) of *Euphorbia Celastroides* Boiss. The other cited material is more scraggly, has its fewer and somewhat smaller (1.5–4.5 cm. long) leaves more localized in almost rosette-like terminal clusters, and has either flowers in anthesis or (*Fosberg* 8,714) matured capsules, but in technical characters and from geographic and ecological considerations appears to be identical.

Labordia Fagraeoidea var. *δ* **jugorum** Sherff, Amer. Journ. Bot. 25: 587. 1938.

Branchlets angulate (because of decurrent leaves), glabrous. Leaves sessile or more rarely petiolate with petiole up to 1 cm. long, spatulate-oblanceolate, glabrous or very remotely setose on lower surface, gradually cuneate-narrowed below to base or petiole, at apex acuminate, principal ones often 7–10 cm. long and 2–3 cm. wide. Inflorescence sessile, contracted, 3–7-flowered, glabrous. Calyx about 7–10 mm. long, glabrous, sepals more often lanceolate and apically sharp. Corolla about 2 cm. long.

Type specimen: Collected by *Charles N. Forbes* (with *Dr. C. Montague Cooke*), Koolau Mts., between Punaluu and Kaipapau, Oahu, May 3–8, 1909 (Bish.).

Distribution: On ridges (whence the varietal name) and perhaps elsewhere, in the Koolau Range, Oahu.

Specimens examined: *Charles N. Forbes* 2,208–*O*, Wahiawa-Kahana Trail, August 17–20, 1915 (Bish.; pistillate); *Forbes* 2,552–*O*, Konahuanui ridges, March 17, 1919 (Bish.; staminate); *Forbes* (with *C. M. Cooke*), Koolau Mts., between Punaluu and Kaipapau, May 3–8, 1909 (type, Bish.; staminate).

Labordia Fagraeoidea var. ε **sessilis** (A. Gray) Sherff, Amer. Journ. Bot. 25: 587. 1938; *Labordia sessilis* A. Gray, Proc. Amer. Acad. 4: 323. 1860.

Branchlets densely papillate-hispid on younger portions, the hairs more or less brownish. Leaves subsessile or shortly petiolate with petioles to about 8 mm. long, diverse in shape but mostly rather widely oblanceolate, normally under 8 cm. long and 3.5 cm. wide but (on sterile or teratological specimens) frequently up to 1.5 dm. long and to 4.5 cm. wide, usually more or less brown-hispid underneath especially along the larger veins. Sepals oblong-lanceolate, acute at apex, distinctly 3–7-nerved, externally hispid, now small (7–12 mm. long) now large (10–18 mm. long). Corolla 2–2.5 cm. long. Capsule shortly pedicellate, 3-valved; valves ±1.4 cm. long, carinate at top; persistent stylar beak slender, about 3 mm. long.

Type specimen: Collected by the *United States Exploring Expedition under Captain Wilkes*, Oahu, 1840 (U. S.).

Distribution: Koolau Range, Oahu.

Specimens examined: *Degener, Salucop, & Arlantico* 11,550, shrub 2–3 feet tall, on wind- and rain-swept summit, C.C.C. Trail, Aiea, December 6, 1937 (Berl.; Deg.; Field, 2 sheets; mostly sterile or abortive); *Degener, Salucop, & Arlantico* 11,552, same locality and date (Berl.; Deg.; Field; sterile); *Francis R. Fosberg* 8,698, bush 2 meters tall, in rain-forest, alt. 850 meters, on south ridge of Kipapa Gulch, Koolau Mts., Waipio, September 18, 1932 (Field; vegetative);

Fosberg 8,699, bush 1.5 meters tall, alt. 900 meters, in scrubby rain-forest, head of Kipapa Gulch, summit of Koolau Mts., Waipio, September 18, 1932 (Bish.; Field; mature capsules 7–9 mm. tall); *Fosberg* 8,714, bush 2 meters tall, in scrubby, wet forest, alt. 900 meters, summit of Koolau Mts., above Kipapa Gulch, Waipio, September 18, 1932 (Bish.; mature capsules about 8 mm. tall); *Fosberg* 9,723, bush 2 meters tall, flowers yellow, leaves pale underneath, alt. 850 meters, on wooded ridge, Kipapa Gulch, Waipio, August 6, 1933 (Bish.; Field; sterile or abortive); *Fosberg* 9,725, shrub 1 meter tall, flowers yellow, alt. 860 meters, exposed ridge, Kipapa Gulch, Waipio, August 6, 1933 (Bish.; Field; staminate); *Fosberg* 9,741, bush 1–2 meters tall, flowers yellow, alt. 860 meters, same locality and date (Bish.; Field; abortive-flowering); *Fosberg* 13,860, shrub 0.2–0.5 meter tall, leaves white beneath, veins pellucid, flowers orange, fleshy, alt. 730 meters, on wet, brushy, windswept ridge, top of cliffs at head of Haiku Valley, main divide of Koolau Mts., Heeia, May 23, 1937 (Bish.; Field; pistillate); *Fosberg & E. Y. Hosaka* (see also *Hosaka & Fosberg*) 13,914, shrub 3 meters tall, leaves pallid beneath, veins pellucid, flowers orange-yellow, alt. 860 meters, in wet forest, main divide, crest of Koolau Mts., between Waianu Gulch and Kipapa Gulch, May 30 and 31, 1937 (Bish.; Field; staminate); *Fosberg & Hosaka* 13,917, tree 5 meters tall, leaf-veins pellucid, flowers yellow, alt. 850 meters, in wet forest, same locality and date (Bish.; Field; staminate but somewhat abortive); *Fosberg & Hosaka* 13,919, shrub 1 meter tall, leaves dark green above, lighter beneath, flowers orange-yellow, on wet, turfy slope, alt. 800 meters, main divide, crest of Koolau Mts., between Uwau Gulch and Kipapa Gulch, May 30 and 31, 1937 (Bish.; Field; pistillate); *Fosberg & Hosaka* 13,921, shrub 1 meter tall, veins pellucid, flowers orange-yellow, alt. 820 meters, on wet, steep, turfy slope, same locality and dates (Bish.; Field; staminate); William Hillebrand, Hawaiian Isls. (U. S.; fragment); *Hillebrand*, Wailupe (Berl.; staminate); *Hillebrand*, peak of Waipahia, Nuuanu (Berl.; Kew; staminate); *Hillebrand & Lydgate*, Oahu (Bish.; fragment); *Edward Y. Hosaka* 598, bush 5 feet tall, on wet, denuded ridge, south ridge, Kipapa Gulch, Waipio, Koolau Mts., July 4, 1932 (Bish.; Field; staminate); *Hosaka* 679, shrub 4 feet tall, alt. 2,500 feet, on denuded ridge, same locality and date (Bish.; Field; apparently teratological); *Hosaka* 1,139, shrub 4 feet tall, alt. 2,500 feet, on denuded ridge, Kipapa Gulch, Koolau Mts., August 6, 1933 (Berl.; Bish.; Field; staminate but partly abortive); *Hosaka* 1,195, on wet slope, alt. 1,800 feet, Kipapa Gulch, Koolau Mts., Waipio, August 7, 1933 (Bish.; Field; Gray; Kew; abortive); *Hosaka & Fosberg* (see also *Fosberg & Hosaka*) 1,875, bush 5 feet tall, occasional on wet, wooded slope, alt. 2,600 feet, divide between head of Kipapa and Uwau Gulches, Koolau Range, May 30, 1937 (Bish.; pistillate); *Hosaka & Fosberg* 1,880, bush 4 feet tall, alt. 2,700 feet, on wooded slope below ridge, divide between head of Waikane and Waikakalaua Gulches, Koolau Range, May 30, 1937 (Bish.; Field; staminate but mostly abortive); *Hosaka & Fosberg* 1,881, bush 6 feet tall, occasional on wet, wooded slope, alt. 2,600 feet, same locality and date (Bish.; Field; staminate); *Horace Mann & William T. Brigham*, Oahu (Corn.; staminate); *Jules Remy* 343*bis*, mountains of Oahu, April, 1855 (Par.; subflowering); *O. H. Swezey*, Lanihuli, June, 1919 (Bish.; staminate); *U. S. Explor. Exped. under Capt. Wilkes*, Oahu, 1840 (type, U. S.: cotype, Gray; fruiting).

Until now *Labordia sessilis* A. Gray has been more or less enigmatic with botanists. Horace Mann (Proc. Amer. Acad. 7: 196. 1867) reduced it to *L. Fagraeoidea* Gaud. Hillebrand (Fl. Haw. Isls. 290. 1888) modified Gaudichaud's description of *L. Fagraeoidea* to read, "generally glabrous, but sometimes the young shoots and inflorescence coarsely pubescent," and then likewise reduced *L. sessilis* to *L. Fagraeoidea.*

Rock (Indig. Trees Haw. Isls. 406. 1913) maintained *L. sessilis* as a valid species "certainly distinct from *L. Fagraeoidea,*" but from Rock's text it is evident that he lacked a clear notion of what the genuine *L. sessilis* really was. Thus his opinion is of little value to us here. Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 163. 1936) has recently made a critical study of the two original specimens studied by Gray and refrains from attempting a definite disposition of them. He writes of *L. sessilis* Gray: "Possibly it belongs in the vicinity of *L. Fagraeoidea.*"

Fortunately, I have been able to examine much illustrative material collected the past few years on Oahu by Degener, Fosberg, Hosaka, Swezey, and others, and have been able to reach a satisfactory understanding of Gray's type specimens. These latter were of two kinds. One had moderately small, widely oblanceolate leaves and mature capsules 1.2–1.5 cm. long, capped by a slender stylar beak about 3 mm. long. The other was a sterile shoot with gigantic, oblanceolate leaves, these up to about 15.5 cm. long and to over 4 cm. wide. On both, but conspicuously so on the sterile one, the distal internodes and the under surfaces of the leaves' veins were densely brown-hispid. There seems no question that the sterile shoot (which, together with the other type material and numerous connecting specimens, lies before me) is merely a more or less abnormal, perhaps teratological representative of the smaller-leaved fruiting form. Various collectors have distributed the two forms under the same number and doubtless in many instances had collected them from the same bush or tree. Invariably, sprays with elongate leaves are found to lack flowers and fruits, or at most to have abortive and *mutually* more or less diverse flowers. At times the flowers are especially abortive and numerous.

Compared with typical *L. Fagraeoidea,* the smaller-leaved sprays are found to differ chiefly in having the distal few internodes of the branchlets densely hispid, the leaves perhaps narrower and more oblanceolate, and the sepals sharper-pointed and more slender. *L. sessilis* is seen at once to be of co-ordinate rank with vars. *Humei* and *conferta* under *L. Fagraeoidea,* to a variety of which it must therefore be reduced.

Labordia Fagraeoidea var. ϵ **sessilis** f. 1. **glabrescens,** f. nov.

Ramuli apices versus non vel aegre hispiduli; foliis subtus normaliter sparsim adpresso-hispidis.

Branchlets glabrous or only weakly hispidulous along terminal internodes; leaves usually appressed-hispid beneath with scattered hairs.

Type specimen: Collected by *Edward P. Hume,* no. 556, shrub, alt. 1,700 feet, by stream, Kaluanui Valley, Oahu, May 8, 1932 (Bish.).

Distribution: Along the Koolau Range of Oahu.

Specimens examined: *Otto Degener & Emilio Ordoñez* 12,059, wide bush 3 feet tall, on rain-swept shrubby summit, C.C.C. Trail, Kawailoa, July 3, 1938 (Berl.; Deg.; Field; abortive-flowering); *Degener & Ordoñez* 12,061, on wind-swept shrubby summit, same locality and date (Deg.; Field; abortive-flowering); *Degener, Park, Bush, Potter, & Topping* 10,121, shrub in rain-forest, Anahulu Trail, Koolau Range, June 16, 1935 (Berl.; Deg.; Field; pistillate); *Otto Degener, Kwan Kee Park, & Y. Nitta* 10,334, on rain-swept summit, along Pig-God Trail, Punaluu, June 22, 1932 (Berl.; Field; abortive-flowering); *Degener, Park, & Nitta* 10,335, same locality and date (Berl.; Deg.; Field, 2 sheets; staminate but abortive); *Francis R. Fosberg* 12,249, shrub 1 meter tall, leaves pallid beneath, veins pellucid, flowers deep chrome yellow, on wet, steep, exposed, brushy slope, alt. 750 meters, Waikane-Schofield Trail, Koolau Mts., Kahana, July 27, 1935 (Bish.; Field; abortive-flowering); *Hosaka & Fosberg* 1,871, bush 5 feet tall, occasional on wet, wooded slope, alt. 2,650 feet, divide between head of Kipapa and Waianu Gulches, May 30, 1937 (Bish.; subflowering); *Hosaka & Fosberg* 1,918, bush 5 feet tall, occasional on wooded slope, alt. 2,300 feet, Puu Kainapuaa, Koolau Range, May 31, 1937 (Bish.; Field; abortive-flowering); *Hume* 556 (type, Bish.: cotype, Field; pistillate); *Charles Judd* (*Otto Degener* distrib. no.) 10,116, in rain-forest, Konahuanui, December, 1935 (Field; sterile).

This form seems particularly susceptible to insect or fungus attack in its branch tips. The result is often an extremely teratological appearance of the apical portions. The flowers in such cases are often very numerous (even forty or more) in a more or less spicate umbel, and are either abortive or fairly normal but smaller than in average specimens of the variety proper. The glabrescent nature of the branchlets in their distal portions might seem in the description to imply a closer affinity with the species proper, but the various specimens examined appear on careful comparison to have leaves more as in var. *sessilis*. A comparative field-study of *L. Fagraeoidea* proper, var. *sessilis* proper, and forma *glabrescens* is much to be desired, with special regard to their natural affinities as shown by calyces in normally (that is, not teratologically) developed material. In var. *sessilis* proper the sepals seem to be more often narrow, sharp at apex, and almost or quite glabrous. However, some material shows sepals mostly oblong or mostly pubescent or both.

Labordia Fagraeoidea var. ζ **waianaeana** Sherff, Amer. Journ. Bot. 25: 587. 1938.

Branchlets obtusely tetragonal, glabrate. Leaves (sometimes narrowly) obovate, up to 15 cm. long and 6.5 cm. wide, thin, glabrous above, sparsely appressed-hispid beneath, at apex acuminate, petiole indistinct and up to about 12 mm. long. Calyx about 1.3–1.5 cm. long; sepals thin, on dorsal surface (at least below middle) densely subappressed-hispid, now linear now widely oblong. Corolla ±2.2 cm. long; lobes narrowly lanceolate, very sharply apiculate, 10–12 mm. long.

Type specimen: Collected by *Francis R. Fosberg*, no. 10,369, leaves white beneath, flowers orange-yellow, calyx hirsute, bush 1 meter tall, in wet, boggy forest, alt. 1,235 meters, Puu Kaala, Waianae Mts., Waianaeuka, November 5, 1933 (Bish.).

Distribution: Known only from Mt. Kaala, in western Oahu.

Specimens examined: *Degener, Salucop, & Arlantico* 12,020, in rain-forest near summit, Kaala, May 1, 1938 (Deg.; Field; fruiting); *Francis R. Fosberg* 10,367*a*, bush 1.5 meters tall, leaves white beneath, in wet, boggy forest, alt. 1,225 meters, Puu Kaala, Waianaeuka, November 5, 1933 (Bish.; Field; sterile); *Fosberg* 10,369 (type, Bish.: cotype, Field; pistillate); *J. Arthur Harris* C242,120, shrub with yellow flowers, alt. 4,000 feet, summit of Puu Kaala, August 24, 1924 (Goth.; Minn.; subflowering).

The leaves of Fosberg's specimens are noticeably thin; they are also bluish-green, doubtless from the method of drying employed. *Harris* C242,120 has the leaves mostly narrow-obovate. It had been determined by Skottsberg as *Labordia Fagraeoidea* Gaud. (cf. Meddel. Göteborgs Bot. Trädgård 10: 154. 1936).

Labordia Fagraeoidea var. η **Saint-Johniana** Sherff, Amer. Journ. Bot. 25: 587. 1938.

Similar in habit to var. *waianaeana*. Inflorescence commonly 3–8-flowered, hispid, pedicels short. Sepals broadly ovate or rotund-cordate, at apex subobtuse or acute, on dorsal surface erectly appressed-hispid, commonly under 1 cm. long. Corolla about 1.5 cm. long; lobes yellow, reflexed, lanceolate or ovate, at apex sharp, more or less white-hispid within.

Type specimen: Collected by *Harold St. John*, no. 17,605, petals reflexed, yellow, shrub 5 meters tall, on wooded ridge, alt. 2,800 feet, Puu Kawiwi-Mt. Kaala ridge, Makaha-Waianaekai, Oahu, March 31, 1935 (Bish.).

Distribution: Waianae Range of western Oahu.

Specimens examined: *Francis R. Fosberg* 13,013, shrub 2 meters tall, flowers yellow, on moist, wooded ridge, alt. 800 meters, east ridge of Puu Kalena, Waianaeuka, March 22, 1936 (Bish.; Field; staminate); *Alfred Meebold* (*Otto Degener* distrib. no.) 10,239, alt. 4,000 feet, Waialua side of Puu Kaala, June 18, 1932 (Bish.; Deg.; subflowering); *St. John* 17,605 (type, Bish.: cotype, Field; staminate).

Labordia Fagraeoidea var. θ **longisepala** Sherff, Amer. Journ. Bot. 25: 587. 1938.

Branchlets slender, 1 or 2 terminal internodes moderately hispid. Leaves oblong-oblanceolate, at apex easily acuminate, cuneately narrowed below into a slender more or less setose, 5–11 mm. long petiole, glabrous above, sparsely appressed-hispid beneath, blade 5–8.5 cm. long and 1.5–3 cm. wide. Sepals lanceolate or widely oblong, several-nerved, glabrate or irregularly and sparsely appressed-setose, 1.4–1.8 cm. long, equaling the corolla. Capsule unknown.

Type specimen: Collected by *Charles N. Forbes,* on Kaaawa Valley ridges, Oahu, May 30, 1909 (Bish.).

Distribution: Known only from type locality in northeasternmost Oahu.

Specimens examined: *Forbes,* Kaaawa Valley ridges, May 30, 1909 (type, Bish.; staminate).

A plant of peculiar aspect and deserving of more study. The type sheet bears three sprays, with a total of 4 inflorescences, these 1–3-flowered. The flowers are subsessile and subtended by apparently two distinct types of bractlets: one kind linear and about 3–4 mm. long, the other kind very delicately filiform and often 1–2 cm. long.

Labordia Fagraeoidea var. ι **septentrionalis** Sherff, Amer. Journ. Bot. 25: 588. 1938.

Leaves a little narrower and entirely or essentially glabrous beneath; sepals wider, ±1.5 cm. long. Corolla about 2.5 cm. tall, lobes lanceolate and sharply apiculate.

Type specimen: Collected (anonymously, but perhaps by *Joseph F. Rock*) on mountains of Punaluu, Oahu, August 18, 1908 (Bish.).

Distribution: Northern Oahu.

Specimens examined: *Anon.,* mountains of Punaluu, August 18, 1908 (type, Bish.; staminate); *Otto Degener* 10,247, in summit rain-forest, Pupukea-Kahuku region, April 1, 1929 (Deg.; Field; subflowering); *Otto Degener, R. Northwood, & J. Foster* 12,295, on shrubby, rain-swept summit, Anahulu Trail, Oahu, March 23, 1939 (Berl.; Deg.; Field; Par.); *Otto Degener & Kwan Park* 10,244, in rain-forest at summit, Pupukea-Kahuku region, March 27, 1933 (Deg.; Field; fruiting); *Degener, Park, Topping, & Bush* 10,236, shrub 4 feet tall, in rain-forest at summit, Pupukea-Kahuku, May 17, 1931 (Field; subflowering); *Francis R. Fosberg* 9,402, bush 1.5 meters tall, in wet forest, alt. 540 meters, Laie-Malaekahana Ridge, Koolau Mts., April 15, 1933 (Field; post-fruiting).

Labordia Fagraeoidea var. κ **Hillebrandii** var. nov.

Folia iis varietatis *septentrionalis* similia sed infra plus minusve adpresso-setosa. Inflorescentia saepius 5–15-flora. Sepala ovata vel ovato-oblonga vel oblongo-lanceolata, tergo nisi supra perspicue setulosa, 1–1.6 (–2.1) cm. longa. Capsula rostro ±2 mm. longo excepto 10–14 mm. alta.

Leaves similar to those of var. *septentrionalis* but more or less appressed-setose on lower surface. Inflorescence more often 5–15-flowered. Sepals ovate or ovate-oblong or oblong-lanceolate, dorsally very setulose at least below, 1–1.6 (–1.8) cm. long. Capsule 10–14 mm. tall exclusive of rostrum (this ±2 mm. long).

Type specimen: Collected by *William Hillebrand*, Hawaiian Islands (Kew).

Distribution: Oahu.

Specimens examined: *Otto Degener, E. Ordoñez, & J. Foster* 12,336, in rich, dense forest at summit, Puu Hapapa, Oahu, May 7, 1939 (Berl.; Deg.; Field); *Degener, Park, Bush, Potter, & Topping* 10,120 *pro parte*, a slender tree 12 feet tall, in forest, Anahulu Trail, Koolau Range, June 16, 1935 (Berl.; Deg.; Field; staminate; *cum L. molokaiana var. phyllocalyce commixt.*); *Hillebrand*, Hawaiian Isls. (type, Kew; subflowering and fruiting); *Hillebrand*, Kaala (Berl.; exactly matching type, of which it is undoubtedly a duplicate).

Appears to differ sharply from vars. *St. Johniana* and *waianaeana*, both likewise natives of northwestern Oahu, in its thicker, coriaceous leaves, these as firm as in the species proper.

Hillebrand (Fl. Haw. Isls. 290. 1888) specially noted the Kaala material (which he referred to *L. Fagraeoidea* proper) for its large outermost calyx-lobes (mostly ±2 cm. long and 8–13 mm. wide). He seems to have overlooked the possibility of teratology, but it is noteworthy that his two specimens at Berlin and one at Kew having hypertrophied sepals are sterile, while his other specimens (mounted on the same sheet in each case), with smaller sepals, have flowers or fruits. (Hillebrand, loc. cit., contrasted the Kaala material with that from Wailupe, which latter he likewise referred to *L. Fagraeoidea* proper. The Wailupe material is here referred, however, to var. *sessilis*, q.v.)

Labordia Fagraeoidea var. κ **Hillebrandii** f. 1. **subcalva** Degener & Sherff, f. nov.

A varietate ipsa calycis lobis dorsaliter glabris vel inferne tantum sparsim setulosis differt.

Differing from variety proper in having its sepals dorsally glabrous or only sparsely setulose below.

Type specimen: Collected by *Otto Degener, Emilio Ordoñez, & J. Foster*, no. 12,336*a*, in rich, dense forest at summit, Puu Hapapa, Waianae Range, Oahu, May 7, 1939 (Field).

Distribution: Known only from type locality in western Oahu.

Specimens examined: *Degener, Ordoñez, & Foster* 12,336*a* (type, Field: cotypes, Berl.; Deg.).

Labordia Fagraeoidea var. λ **simulans** Degener & Sherff, var. nov.

Ramuli subangulati, glabri. Petioli graciles usque ad 1.5 cm. longi; laminae elliptico-lanceolatae, apice attenuato-acuminatae, basi cuneatae, submembranaceae, infra glabrae vel sparsissime adpresso-setosae, usque ad 9 cm. longae et 3 cm. latae. Inflorescentia saepius 3- (interdum 1- vel 2-) flora, floribus iis *L. molokaianae* var. *phyllocalycis* similibus. Sepala plus minusve ovata, 5–9-nervata, dorso pallida et subsparse adpresso-hispida vel supra glabrata, circ. 1.2–1.4 cm. longa et 5–7.5 mm. lata, corollae tubum ±8 mm. longum superantia. Corollae lobi late lanceolati vel ovati, patentes reflexive. Capsula ignota.

Ultimate branchlets subangulate, glabrous. Petioles slender, up to 1.5 cm. long; blades elliptic-lanceolate, at apex attenuate-acuminate, at base cuneate, submembranaceous, beneath glabrous or very sparsely appressed-setose, up to 9 cm. long and 3 cm. wide. Inflorescence more often 3-flowered, the flowers similar to those of *L. molokaiana* var. *phyllocalyx*. Sepals more or less ovate, 5–9-nerved, dorsally pallid and subsparsely appressed-hispid or toward top glabrate, about 1.2–1.4 cm. long and 5–7.5 mm. wide, surpassing the corolla-tube. Corolla's lobes ovate or widely lanceolate, spreading or reflexed; tube ±8 mm. long.

Type specimen: Collected by *Otto Degener, Kwan Kee Park, D. LeRoy Topping, William Bush, & Colin Potter*, no. 10,284, a tree 12 feet tall, in forest, Waimano, Oahu, June 9, 1935 (Field).

Distribution: South-central to northwestern Oahu.

Specimens examined: *Degener, Ordoñez, & Foster* 12,356, in shrubby forest near top, southeast slope of Puu Hapapa, June 4, 1939 (Berl.; Deg.; Field; fruiting); *Degener, Park, Topping, Bush, & Potter* 10,284 (type, Field: cotypes, Berl.; Deg.; pistillate).

The slender leaf-petioles are more typical of *L. Fagraeoidea*, but the large sepals are suggestive of *L. molokaiana* var. *phyllocalyx*.

3. **Labordia pallida** H. Mann, Proc. Amer. Acad. 7: 196 (Enum. Haw. Pl. no. 384). 1867; Skottsberg, Meddel. Göteborgs Botan. Trädgård 10: 162, *fig. 20, i–m*. 1936.

Leaves glabrous, principal ones 2–3.5 cm. wide; capsule ±1.4 cm. long .... *L. pallida sensu stricto.*

Leaves appressed-hispidulous beneath, principal ones 5–6 cm. wide; capsule 1.6–2.3 cm. long...................... var. β *hispidula.*

Glabrous, branchlets grayish and subterete to subtetragonal. Leaves mostly clustered toward tips of branchlets; petiole slender, 6–13 mm. long; blade oblong or narrowly obovate-oblong, membranaceous at least when dry, gradually or subabruptly narrowed toward base, at apex more acuminate than for *L. Fagraeoidea* proper, pale underneath, 6–11 cm. long and 2–3.5 cm. wide. Cyme sessile, 5–15-flowered; pedicels ±2 mm. long, slender, pubescent; bractlets linear, acute, pubescent, about 5 mm. long. Calyx more or less pubescent, 5–8 mm. long, deeply cleft into sharply lanceolate or linear-lanceolate lobes (these thin, 5–7- or rarely -9-nerved and having a broad, hyaline margin with densely ciliate edge). Corolla externally glabrate or puberulent, tube slightly pilose within and about 1 cm. long; lobes more or less spreading-hirsute within, 6–8 mm. long, about 1.5 mm. wide. Anthers oblong, only about 2.5 mm. long and 1 mm. thick, hardly mucronulate. Pistillode slenderly clavate, from apex gradually (not abruptly) narrowed downward, protruding about 5 mm. above calyx (as seen after removal or fall of corolla) and 0.3–0.5 mm. thick in thickest part. Capsules 2-valved.

Type specimen: Collected by *Horace Mann* and *William T. Brigham,* no. 611, Kealia, Kauai, 1864–1865 (herbarium not cited, but the Cornell University and Gray Herbarium specimens would probably have equal claim to ranking as the type).

Distribution: Kauai.

Specimens examined: *Charles N. Forbes* 689–*K,* Hii Mountains (Bish.; Mo.; fruiting); *Mann & Brigham* 611 (type collection, Bish.; Corn.; Field; Gray; Mo.; staminate); *Harold St. John & Francis R. Fosberg* 13,576, shrub 8 feet tall, leaves dark shiny green above, whitish beneath, in moist, mossy woods, alt. 1,800–2,000 feet, Wahiawa Valley, trail to Kahili Bog, Wahiawa, December 24, 1933 (Bish.; Field; sterile, but accompanied—in packet—with 4 capsules of a previous season, these 2-valved, about 1.7 cm. long, the exocarp mostly worn away).

The type specimens are staminate, whence it would appear that Mann's original description of the ovary ("ovario bi-triloculari") was obtained from inspection of the rudimentary ovary of a pistillode. The Forbes specimens from the Hii Mountains have leaves identical with those of the type collection, and the 1–3 capsules on short (3–6 mm.), stout, cernuous pedicels, 2-valved, ovoid or globose-ovoid, glabrate but of course wrinkled, 13–15 mm. long, the valves scarcely carinate but minutely (±0.5 mm.) rostrate. The leaves of *L. pallida* appear, in herbarium specimens, thinner than those of *L. Fagraeoidea* proper and are more sharply acuminate at their apex. The narrowly clavate pistillodes are especially distinctive, the pistillodes in most other species of the genus being thickened-ovoid or -cylindric at top. Skottsberg (loc. cit.) studied this species, concluding that "to judge from the type collection, *L. pallida* has to be retained as a separate species." It is apparent from his description and figure, however, that the material examined by him had only younger pistillodes and hence failed to reveal fully one of its outstanding characters.

Labordia pallida var. *β* **hispidula** var. nov.

Folia majora, pauca (3) visa 14–16 cm. longa petiolo 1.5–2 cm. longo adjecto et 5–6 cm. lata, infra dense adpresso-hispidula. Sepala hispidula. Capsula glabrata, 1.6–2.3 cm. longa rostro minimo sub 0.4 mm. longo incluso.

Leaves larger, the few (3) seen measuring 14–16 cm. long including the petiole (this 1.5–2 cm. long) and 5–6 cm. wide. Sepals hispidulous. Capsule glabrate, 1.6–2.3 cm. long including the very small rostrum (this under 0.4 mm. long).

Type specimen: Collected by *Charles N. Forbes*, no. 256–*K*, Wahiawa Mountains, Kauai, August, 1909 (Mo.).

Distribution: Southern Kauai.

Specimens examined: *Forbes* (with *C. Dole*) 41–*K*, Waipau Valley and Ridge, July 15, 1909 (Berl.; Bish.; Field; Kew; Par.; fruiting); *Forbes* 256–*K* (type, Mo.: cotypes, Bish.; Field; Kew; fruiting).

4. **Labordia pedunculata** sp. nov.

Rami griseo-brunnei, teretes, glabri; ramulis subangulatis, glabris. Folia opposita, oblanceolata vel subrhomboideo-ovata vel oblongo-ovata, apice breviter acuminata, basi plus minusve sensim in petiolum forsan papillatum sed glabrum usque ad 1.5 cm. longum angustata; lamina coriacea, infra pallida, utrinque glabra, usque ad 12 cm. longa et 4.5 cm. lata, nervis principalibus lateralibus circ. 8–10 pro utroque latere; stipulis vix connatis, 2–4 mm. altis. Inflorescentia (floribus non visis) pedunculata pedunculo glabro demum 1.8–2.5 cm. longo 1.5–3 mm. crasso erecto recurvatove, 2- vel 3-pedicellata pedicellis tenuibus glabris 1.8–3 cm. longis moderate divergentibus mediane bracteolatis bracteola lineari subcapilliformive glabra ±3 mm. longa. Sepala 5, distincta, lanceolata, 5–7.5 mm. longa, non manifeste nervata. Capsula ovoidea, 2-valvata, glabra sed scrobiculata, ovario circ. 11–14 mm. longo et 1 cm. crasso, rostro tenui erecto vix 3 mm. longo; valvis ecarinatis.

Branches grayish-brown, terete, glabrous; branchlets subangulate, glabrous. Leaves oblanceolate or subrhomboid-ovate or oblong-ovate, at apex shortly acuminate, at base more or less gradually narrowed into a petiole, this perhaps papillate but glabrous and up to 1.5 cm. long; blade coriaceous, pallid underneath, glabrous on both surfaces, up to 12 cm. long and 4.5 cm. wide, about 8–10 principal lateral nerves on each side of midrib. Inflorescence (flowers not seen) pedunculate; peduncle glabrous, finally 1.8–2.5 cm. long and 1.5–3 mm. thick, erect or recurved, 2- or 3-pedicellate; pedicels slender, glabrous, 1.8–3 cm. long, moderately diverging, bracteolate at the middle with a linear or subcapilliform bracteole, this glabrous and ±3 mm. long. Sepals 5, distinct, lanceolate, 5–7.5 mm. long, not manifestly nerved. Capsule ovoid, 2-valved, glabrous but scrobiculate, its ovary about 11–14 mm. long and 1 cm. thick, its rostrum erect and barely 3 mm. long; valves ecarinate.

Type specimen: Collected by *Charles N. Forbes*, in Hawaiian Islands. The type label says, "E. Maui? 1920?" (Bish.).

Distribution: Not known for a certainty, except that the plant occurs somewhere in the Hawaiian Islands.

Specimens examined: *Forbes*, Hawaiian Isls. (type, Bish.).

A species with the foliar habit of *L. Fagraeoidea*, but differing from that species in its pedunculate inflorescence and 2-valved capsules, the valves of which are not carinate. Because of the uncertainty regarding the locality from which the type was obtained, it is much to be hoped that this species will before long be rediscovered and definite data as to its geographic occurrence be placed on record.

5. **Labordia pumila** (Hillebr.) Skottsb., Meddel. Göteborgs Botan. Trädgård 10: 160, *fig. 20, a–h.* 1936; *Labordia pallida* f. *alpina* Wawra, Flora 55: 516. 1872; *Labordia Fagraeoidea* var. *pumila* Hillebr. Fl. Haw. Isls. 290. 1888.

Dwarf, sparingly branched, glabrous shrub, ±3 dm. tall, with sharply or at times alately tetragonal branchlets. Leaves elliptic-obovate, basally cuneate and decurrent into a very short petiole, apically wide-rotundate and short-acuminate, very glabrous, softly coriaceous, when dry pale and glaucescent on lower surface (this beautifully and arcuately penninervate with much darker nerves), 4–10.5 cm. long and 2–4.5 cm. wide; stipules large, semicircular. Cymes up to 15-flowered, glabrous; capsuliferous pedicels at maturity up to 15 mm. long, thickened, ligneous; bractlets filiform-linear to very narrowly linear-spatulate, 5–7 mm. long. Sepals oblong-linear to ovate-lanceolate, glabrous or obscurely pubescent, at apex more or less acute, 5–7-nerved, 8–11 mm. long and 2–3.5 mm.wide; corolla sparingly or moderately hirsute, 15–16 mm. long, its tube 9–10 mm. and narrow lobes 5–7 mm. long; sterile anthers sagittate, 1.8–2 mm. long; fertile anthers oblong, basally sagittate, 3.7–4 mm. long; pistillode glabrous, about 1.2 cm. long, its ovary cylindric-conic and 4–4.5 mm. long, its style filiform and about 4 mm. long, its 3 stigmata closely connate; pistil 8–10 mm. long; ovary cylindric-fusiform, 3-merous and 3-sulcate, about 7 mm. long and 3 mm. thick, glabrous or apically somewhat setose; style very short or lacking; stigmata 3, erect, 2.5–2.8 mm. long, externally covered with rather long and projecting papillae. Capsule ovoid-trigonous, shortly mucronate, glabrous, 12–13 mm. long and 6–8 mm. thick, the three valves obscurely carinate toward their apex.

Type specimen: Collected by *Heinrich Wawra*, no. 2,164 (alt. 5,080 feet, on the highest peak of Waialeale, Kauai, 1868–1871 (Mus. V.).[1]

Distribution: Northwestern Kauai.

Specimens examined: *Charles N. Forbes* 905–*K*, Alakai Swamp, July 3–August 18, 1917 (Bish.; subflowering); *Forbes* 938–*K*, Waimea Drainage Basin, same date (Bish.; fruiting); *Forbes* 1,153–*K*, Alakai Swamp, same date (Bish., 2 sheets; Field; fruiting); *Rev. J. M. Lydgate*, Kaholuamanu (Bish.; fruiting); *Joseph F. Rock*, Kauai, October, 1916 (Bish.; fruiting); *Rock* 4,874, without data (Bish.; staminate); *Rock* 5,813, summit of Waialeale, September 23, 1909 (Bish.; staminate); *Rock* 8,884, Waialeale, October 20, 1911 (Bish., 4 sheets of separate staminate and fruiting specimens; Gray, 1 sheet of pistillate and 1 sheet of separate staminate and fruiting material, the sheets studied by Skottsberg); *Carl Skottsberg* 964, Alakai Swamp, between Kokee and Kilohana, October 27, 1922 (Goth.; pistillate, both flowering and fruiting).

Hillebrand's herbarium (Berl.) contains no specimen representing *L. Fagraeoidea* var. *pumila* Hillebr. Indeed, Hillebrand's omission of his customary exclamation mark after the citation of locality shows that he himself had no private specimen at hand (cf. Hillebr.

---

[1] Skottsberg (loc. cit.) sets the sheet of staminate material of Rock 8,884 at Gray Herbarium as the staminate type and Skottsberg 964 (Goth.) as the pistillate type. His adoption of Hillebrand's varietal name *pumila*, however, compels us to accept as type the plant to which the name *pumila* directly leads, namely the type of *L. pallida* f. *alpina* Wawra, which was Wawra 2,164.

op. cit. XCI). His treatment is merely a translation from Wawra and the name *pumila* goes back directly to *L. pallida* f. *alpina* Wawra.

6. **Labordia Hedyosmifolia** Baill. Bull. Soc. Linn. Paris 1: 240. 1880; St. John, Occas. Paps. Bish. Mus. 12: no. 8: *pl. 2*. 1936; *Labordia Fagraeoidea sensu* A. Gray, Proc. Amer. Acad. 4: 323. 1860 (not Gaud.); *Labordia Grayana sensu* Skottsb. *pro parte*, Meddel. Göteborgs Bot. Trädgård 10: 158, *fig. 19, f–i*. 1936.

a. Blades of principal leaves elliptic-oblong, 2–4.5 cm. long and 1–1.5 cm. wide, plant of West Maui . . . . var. γ *Rockii.*

a. Blades of principal leaves various in shape but proportionately broader, normally larger; plants not confined to West Maui.

b. Capsules commonly 2-valved; plants of Hawaii.

c. Sepals dorsally hispid, mostly narrow-linear; capsules (including rostrum) ±1.8 cm. long; terminal internodes of branchlets hispid . . . . var. δ *robusta.*

c. Sepals more or less glabrate, broader.

d. Terminal internodes of branchlets hispid. var. ζ *Skottsbergii.*

d. Terminal internodes of branchlets glabrous.

e. Leaves 5–9.5 cm. long and 2–3.5 cm. wide, definitely cuneate-obovate, the broad terminal portion subabruptly rounded to a short, narrow, subacute tip. var. ε *Grayana* (see also var. θ *magnifolia*, with leaves 9–13 cm. long and 3.5–5 cm. wide).

e. Leaves mostly otherwise.

f. Leaf blades 3–5.5 cm. long and 1.3–2 cm. wide; mature capsules barely 1.5 cm. tall including valvular rostra. var. η *kilaueana.*

f. Leaf blades longer or wider or both; mature capsules about 1.8 cm. tall . . . . *L. Hedyosmifolia sensu stricto.*

b. Capsules commonly 3-valved; plant native of Maui, northeastern Molokai, and Lanai . . . . var. β *centralis.*

b. Capsules 3-valved; plant native of Oahu . . . . . . var. ι *Hosakana.*

Small tree with stiff, angular branches, these glabrous or when young pubescent near tip. Stipules large, connected in a cup-shaped, shallowly or even very deeply emarginate ring, this dark except for a conspicuous, white-chartaceous, supernal border. Leaves commonly dark-brown when dry, greatly varying in shape, falsely suggesting three varieties; now narrowly elliptic-oblong or somewhat oblanceolate- or barely obovate-oblong (as in Remy 362, the type), now mostly obovate, now mostly oblong- or ovate-rotund; blade subacute or shortly acuminate at apex, widely or narrowly cuneate or even rounded at base, subcoriaceous, glabrous and inconspicuously veined above, glabrate or sparingly setose and conspicuously veined beneath (the lateral veins often beautifully arcuate, especially in ovate or subrotund leaves), mostly 5–11 cm. long and 2–5 cm. wide; petiole 4–12 mm. long. Cyme many- (6–15- or even to 22-) flowered, corymbiform or appearing umbellate-contracted, 3–7.5 cm. across, subsessile, branches divergent and often reflexed, the slender ultimate pedicels pubescent or (as in type) glabrous and 4–12 mm. long. Bractlets filiform, 6–12 mm. long. Calyx about 8.5–14 mm. long, cleft to base into 5 ovate to linear, glabrous or glabrate, mostly 3- or 5- or 7-nerved lobes. Corolla orange-colored, externally glabrate (unless above), internally white-pubescent, tube swollen, ±5 mm. thick and 10–13 mm. long, the commonly 6 lobes 6–9 mm. long. Pistillode ±12 mm. long; its ovary slender-conic, ±5 mm. long; style capillary but only about 1–3 mm. long; stigma delicately or stoutly cylindric or clavate, ±6 mm. long. Pistil ±12 mm. long; its ovary cylindric-fusiform, glabrous or at top hispid, ±5 mm. long; narrowed stylar portion ±1.5 mm. long; narrowly cylindric or obconic-cylindric stigma about 4 mm. long. Capsule conic-ovoid, ±1.8 cm. long (including inflexed valvular rostra), 2-valved, the valves moderately cristate-carinate near top.

Type specimen: Collected by *Jules Remy*, no. 362, on the Island of Hawaii, 1851–1855 (Par.).

Distribution: Hawaii, especially the northern half.

Specimens examined: *Miss L. M. Cranwell, Olof Selling, & Carl Skottsberg* 3,166*a*, in sphagnum bog, Kohala, above Waipio along ditch trail between ditch houses 1 and 2, September 8, 1938 (Goth.; "all flowers pistillate"); *iidem* 3,166*b*, same locality and date (Goth.; "all flowers bisexual except one staminate"); *Charles N. Forbes* 298–*H*, Kaalapuuwale, Kona, June 30, 1911 (Bish.; Field; Gray; subflowering); *Forbes* 509–*H*, Kohala Mts., Waimea, September, 1911 (Bish.; subflowering); *Forbes* 721–*H*, along trail to Wailuku River, eastern Hawaii, June 5, 1915 (Bish.; sterile); *Forbes* 723–*H*, in lava flow of 1855, Kilohana, June 6, 1915 (Bish.; subflowering); *Forbes* 726–*H*, eastern Hawaii, June 6, 1915 (Bish.; fruiting); *V. O. Fosberg* 54, bush 1.5–2 meters tall with yellow-orange flowers, in wet tree-fern forest, Hilo side of National Park, Kilauea, August 10, 1936 (Field; subflowering); *Rev. J. M. Lydgate*, Hilo (*ex herb. Hillebrandii* *in* Berl.; subflowering); *Remy* 362 (type, Par.; two specimens on sheet, one flowering and staminate, one pistillate, with flowers and fruits); *Joseph F. Rock* 4,301, Alakahi Gorge, July 12, 1909 (Mus. V.; subflowering); *Rock* (similarly) 4,301, Alakahi-Kawainui Gorge, July 12, 1909 (Bish.; staminate); *Rock* 4,305, same locality and date (Bish., 2 sheets; staminate); *Rock* 8,316, alt. 4,200 feet, Alakahi Valley, Waimea, June, 1910 (Bish., 2 sheets; Gray; Mus. V.; variously staminate and pistillate); *Rock* 8,364, Honokane Nui Stream, Kohala, June, 1910 (Bish., 3 sheets; Gray; Mus. V.; variously staminate and pistillate); *Rock* 8,430, Awini, Kohala, same date (Bish., 4 sheets; Gray; Mus. V.; variously staminate and pistillate, flowering and fruiting); *Rock* 10,017, Hawaiian Isls. (Bish.; staminate); *Harold St. John & Edward Yataro Hosaka* 11,483 *A. H.*, shrub 15 feet tall, in rain-forest, alt. 4,800 feet, Puu Ahia, Kawaihae, Kohala Mts., January 2, 1932 (Berl.; Bish.; Del.; Field; Kew; Par.).

Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 157, *fig. 19, a–i.* 1936) presents, under *L. Grayana* Hillebr., an extended and critical study of this species, with an appended table (no. 3) of measurements of the floral parts on certain specimens examined. He segregates certain specimens from Maui and Lanai as var. *centralis* (vide infra) and states that the variety differs from the species proper "in the more pubescent leaves, and the almost glabrous, trimerous ovary." From the much larger assortment of specimens available for my study, it appears that the matter of leaf pubescence is unreliable. Some specimens from Hawaii have more pubescent leaves (as to lower surface) while various specimens from Maui have almost glabrous leaves. The dimerous ovary of the specimens from Hawaii seems, however, practically constant and has been relied upon by me as connoting the species proper. So far as I know, all material from Maui, Molokai, and Lanai has trimerous ovaries (hence capsules) and is to be referred to var. *centralis.*

Remy 362, the type, has one spray of staminate and one spray of pistillate material. The latter has both flowers and fruits. The former has several pistillodes and these have extremely delicate, clavate stigmas about 6 mm. long. In more recently collected specimens the pistillodes have stouter and more cylindric stigmas, exhibiting an approach to the stigmas of true pistils. Indeed, the stigmas as they protrude partly from the corolla-tube appear so much the same in staminate and pistillate flowers, that a further examination of the style and ovary, also the associated anthers (as to whether they are fertile or sterile) is necessary for positive identification.

Labordia Hedyosmifolia var. β **centralis** (Skottsb.) St. John, Occas. Paps. Bish. Mus. 12: no. 8: 7. 1936; *Labordia Grayana* var. *centralis* Skottsb., Meddel. Göteborgs Bot. Trädgård 10: 159, *fig. 19, k–r.* 1936.

Leaves often slightly more pubescent or setose beneath; capsule commonly trimerous (at times shorter and more globose).

Type specimen: Collected by *Carl Skottsberg*, no. 743, Puu Kukui, West Maui, October 9, 1922 (Goth.).

Distribution: Maui, Molokai, Lanai.

Specimens examined: *E. H. Bryan, Jr.*, 639, small tree, 3 meters tall, alt. 3,500 feet, in lower rain-forest, Haelaau, West Maui, December 20, 1928 (Field; fruiting); *Miss L. M. Cranwell* 3,403, near Pepeopae Bog, Molokai, September 21, 1938 (Goth.; staminate); *Cranwell* 3,503, Pelekunu, Molokai, June 24, 1938 (Goth.; subflowering); *Cranwell, O. Selling, & Carl Skottsberg* 2,671 *pro parte*, Puu Kukui, West Maui, July 26, 1938 (Goth.; subflowering); *iidem* 2,671*b*, on ridge above Haelaau, West Maui, August 1, 1938 (Goth.; fruiting) and 2671*c*, near Haelaau, July 28, 1938 (Goth.; pistillate); *Otto Degener* 10,258, in wind-swept rain-forest, near summit of Puu Kukui [Degener's label says "Mt. Eke"], West Maui, August 29, 1927 (Field; fruiting); *Degener* 10,259, same locality, August 30, 1927 (Berl.; Deg.; Field; pistillate); *Degener* 10,266, in rain-forest, Pipeline Trail, Olinda, East Maui, June 21, 1927 (Field; post-fruiting); *Degener* 10,274, in rain-forest along Papaala Pali, Molokai, June 6, 1928 (Berl.; Field; teratological, with many-flowered, compact inflorescence as in *L. Fagraeoidea* var. *sessilis*); *Degener* 10,301, summer, "either Molokai or Maui" (Field; subflowering); *G. R. Ewart* III, no. 97, in rain-forest, alt. 4,100 feet, Puu Kukui, West Maui, December 19, 1928 (Field; pistillate, post-flowering); *Ewart* no. 114, alt. 4,300 feet, in rain-forest, Haelaau-Puu Kukui Trail, West Maui, December 18, 1928 (Berl.; Bish.; Field; staminate); *Charles N. Forbes*, Nahiku, East Maui, July, 1910 (Bish.; Field; Mo.; fruiting); *Forbes*, with *Dr. C. Montague Cooke, Jr.*, no. 9–*M*, Maunahooma, Maui, May, 1910 (Bish.; Mo.; staminate); *Forbes* 42–*M*, Hanakaoo, West Maui, May, 1910 (Bish.; Brit.; Field; Par.; flowering and fruiting); *Forbes* 102–*M*, Iao Valley, West Maui, June, 1910 (Bish.; Brit.; Field; Mo.; fruiting); *Forbes* 204–*Mo*, mountains above Puu Kolekole, Molokai, June, 1912 (Berl.; Bish.; Field; Gray; Mo.; subflowering); *Forbes* 257–*M*, Nahiku, East Maui, July, 1910 (Berl.; Bish.; Field; Gray; Mo.; fruiting); *Forbes* 332–*Mo*, Wailau Trail, Molokai, August, 1912 (Field; staminate); *Forbes* 387–*M*, Honokahau Drainage Basin, West Maui, September 25–October 17, 1917 (Bish.; pistillate); *Forbes* 1,688–*M*, right side of Kipahulu, East Maui, November 10, 1919 (Bish.; Field; staminate); *Forbes* 2,443–*M*, Wailuku Pali, West Maui, May 21, 1920 (Bish.; Field; staminate); *Forbes* 2,565–*M*, east bank of Honomanu Gulch, East Maui, June 21, 1920 (Berl.; Bish.; Field; fruiting; capsules subglobose, about 1 cm. tall exclusive of rostrum and about 1 cm. thick); *Forbes* 2,650–*M*, west side of Haipuaena Stream, East Maui, June 28–30, 1920 (Bish.; fruiting); *Forbes* 2,652–*M*, same locality and date (Bish.; subfruiting); *Forbes* 2,680–*M*, in swamp, alt. 2,000–3,000 feet, mountains above Hana, Paki, East Maui, July 5, 1920 (Bish.; Field; Kew; staminate and fruiting); *Francis R. Fosberg* 10,044, bush 0.5 meter tall, flowers orange-yellow, in moist forest, alt. 1,550 meters, Puu Kukui, between Haelaau and Nakalalua, West Maui, August 24, 1933 (Field); *William Hillebrand*, Hawaiian Isls. (Mus. V.; pistillate); *Hillebrand*, Haleakala, East Maui (Berl.; staminate); *Hillebrand*, Heights of Pelekunu, Molokai (Berl.; U. S.; staminate and pistillate); *Hillebrand*, West Maui, July, 1858 (Petrop.; subflowering); *Hillebrand*, West Maui, 1870 (Berl.; Gray; staminate); *Hillebrand*, Lanai, July, 1870 (Berl.); *Hillebrand*, "Eke Crater" (in reality Puu Kukui fide C. N. Forbes), West Maui, August, 1870 (Berl.; staminate); *Rev. J. M. Lydgate*, Hilo (*ex herb. Hillebrandii in* Berl.; pistillate); *Horace Mann & William T. Brigham* 434, mountain of West Maui (Bish.; Corn.; Gray; U. S.; pistillate; a form simulating type material of and, though less so, type plate of *L. Fagraeoidea* Gaud. and by Mann [Enum. Haw. Pl. no. 383. 1867] finally regarded as that species); *George C. Munro*, Puu Kukui, West Maui, September 25, 1916 (Bish.; small, fruiting branchlet, with small, narrowly ovate leaf-blades only 4–4.5 cm. long and about 2 cm. wide); *Munro* 610, forest bog, Puu Kukui, September 25, 1916 (Bish.); *Munro* 620, Puu Kukui, September 25, 1916 (Bish.; Field; staminate); *Joseph F. Rock*, Honomanu, East Maui, May, 1911 (Bish., 2 sheets; staminate); *Rock* 8,017, main ridge of Lanai, July 25, 1910 (Bish., pistillate); *Rock* 8,020, highest ridge of Lanai, Lanaihale, July 22, 1910 (Bish., 3 sheets; Field; Gray; Mus. V.; staminate and fruiting); *Rock* 8041, Lanaihale, July 25, 1910 (Bish.; Mus. V.; flowering and post-fruiting); *Rock* 8,153 *pro parte*, Honokawai, West Maui, August, 1910 (Bish.; pistillate); *Rock* 8,155, same locality and date (Bish.; staminate); *Rock* 8,185, Honokawai Gulch, West Maui, August, 1910 (Bish., 2 sheets; Mus. V.; flowering and fruiting); *Rock* 8,538, Honomanu, East Maui, September, 1910 (Bish.; Mus. V.; staminate); *Skottsberg*

743 (type, Goth.; staminate and pistillate); *Harold St. John* 10,228, wooded ridge, alt. 4,200 feet, above Honokowai, Haelaau, West Maui, February 6, 1930 (Bish.; N.Y.; flowering and fruiting; form with leaves pallid, only slightly hispid below, and approaching those of species proper; capsules 3-valved).

Labordia Hedyosmifolia var. γ **Rockii** Sherff, Amer. Journ. Bot. 25: 584. 1938.

Leaves smaller, shortly petiolate, the petiole more often 1–5 mm. long; blade elliptic-oblong, commonly 2–4.5 cm. long and 1–1.5 cm. wide, glabrous on both surfaces. Inflorescence about 3-flowered. Corolla ±1.5 cm. long, the calyx a half shorter.

Type specimen: Collected by *Rock* and *Hashimoto,* "Eke-Honokahau," West Maui, August, 1910 (Bish.).

Distribution: Known only from type locality in central-northern West Maui.

Specimens examined: *Rock & Hashimoto,* "Eke-Honokahau," West Maui, August, 1910 (type, Bish.; staminate).

A variety at once distinguished by its small, narrow, entirely glabrous leaves, as well as by its smaller flowers. A sheet of Mann and Brigham's specimens (no. 434 in Field Museum) of var. *centralis* has a flowering spray with small leaves only 2–3.5 cm. long and at first sight suggestive of this variety. Its leaves, however, are more oval and definitely somewhat hispid beneath as in the larger, more typical leaves of the second spray on the same sheet.

Labordia Hedyosmifolia var. δ **robusta** Sherff, Amer. Journ. Bot. 25: 584. 1938.

Terminal internodes hispid. Leaves conspicuously and narrowly cuneate-obovate, at apex subabruptly rounded and subacuminate, moderately appressed-hispid beneath, the blade commonly 4–7 cm. long and 1.5–3 cm. wide. Inflorescence ±15-flowered, in fruit 5–9 cm. wide, branchlets hispid. Sepals more often narrowly linear, 3–5-nerved, hispid at least on dorsal surface, at apex acute, 0.7–1.2 cm. long. Capsule about 1.8 cm. long (including valvular rostra; body proper about 1.4 cm. long), the two valves conspicuously cristate-carinate above middle, pedicel hispid and commonly 1.5–1.8 cm. long.

Type specimen: Collected by *Joseph F. Rock,* no. 10,015, Nalehu (Naalehu) forests, Hawaii, January, 1912 (Bish., 2 sheets).

Distribution: Known only from type locality in southern Hawaii.

Specimens examined: *Rock* 10,015 (type, Bish., 2 sheets: cotype, Gray; fruiting).

Labordia Hedyosmifolia var. ε **Grayana** (Hillebr.) Sherff, Amer. Journ. Bot. 25: 584. 1938; *Geniostoma Remyana* Baill. Bull. Soc. Linn. Paris 1: 240. 1880 (fide St. John, Occas. Paps. Bish. Mus. 12: no. 8: 7. 1936); *Labordia Grayana* Hillebr. Fl. Haw. Isls. 290. 1888 (*ex syn. Labordia Fagraeoidea sensu* A. Grayi); *sensu* Skottsb. *pro parte,* Meddel. Göteborgs Bot. Trädgård 10: 158, *fig. 19, d* and *e.* 1936; *Labordia Remyana* Baill. *ex* Skottsb., op. cit. 156.

Branchlets glabrous. Leaves essentially glabrous, shortly or moderately petiolate with petiole up to 1.5 cm. long; blade definitely cuneate-obovate, the broad terminal portion subabruptly rounded to a short, narrow, subacute tip, 4–8 cm. long and 2–3.5 cm. wide. Inflorescence 3–15-flowered, less than 5 cm. wide even at fruiting, glabrous. Sepals linear-oblong or oblong-ovate, glabrous, commonly 5-nerved, 7–15 mm. long. Capsule as in var. *robusta* but more slender and slightly shorter, its pedicel glabrous and 5–8 mm. long.

Type specimen: Collected by the *United States Exploring Expedition under Captain Wilkes,* Hawaii, 1840 (U.S).

Distribution: Island of Hawaii.

Specimens examined: *R. S. Bean* (*Otto Degener* distrib. no.) 10,877, Hawaii (Field); *Otto Degener* 10,245, in rain-forest, Napau Crater, December 5, 1929 (Deg.; Field; subflowering and post-fruiting); *Degener* 10,246, in shaded earthquake crack, near Sulphur Banks, Kilauea, October 21, 1929 (Deg.; Field; subflowering); *Degener & Y. Iwasaki* 10,242, in jungle, milepost, Glenwood, January 3, 1930 (Field; subflowering); *Degener, Iwasaki, Brumaghim, & Bartram* 10,243, in rain-forest, Napau Crater, January 25, 1930 (Berl.; Deg.; Field: pistillate); *Charles N. Forbes* 752–*H,* kipuka (i.e., an open, fertile place in forest) in 1855 lava flow, below Halealoha, June 7, 1915 (Bish.; Field, 2 sheets; Kew; Mo.; fruiting); *Harold St. John, Ross S. Bean, & Edward Y. Hosaka* 11,212, in wet ohia [i.e., *Eugenia malaccensis* L.] forest, alt. 2,700 feet, Napau Trail, Chain of Craters, Kilauea, December 20, 1931 (Bish.; Field; a form exactly matching cotype in N. Y.; staminate); *U. S. Explor. Exped.,* Hawaii, 1840 (type, U. S.: cotypes, Gray; N. Y.; staminate).

Asa Gray, working upon material collected on Hawaii by the United States Exploring Expedition, in 1840, doubtfully referred it (loc. cit.) to *Labordia Fagraeoidea* Gaud. Gray noted that his specimens possessed bivalvular capsules. Hillebrand (loc. cit.) excluded

Gray's cited plants from *L. Fagraeoidea* Gaud. and used them as a primary basis for his own *L. Grayana.* Hillebrand included also *Mann* and *Brigham* 434 (which had been referred by Horace Mann—Proc. Amer. Acad. 7: 196. 1867—to *Labordia Fagraeoidea* Gaud.), but that plant is varietally distinct (var. *centralis*). He included also material collected by Lydgate on Hawaii. Hillebrand's private herbarium (now in Berl.) contains a sheet of Lydgate's material from Hilo, Isl. of Hawaii, and this is clearly identical with the United States Exploring Expedition type and cotype specimens of *L. Grayana.*

Unknown to Hillebrand, however, Baillon (loc. cit.) had earlier described material (Remy 362) specifically (*but not varietally*) identical with the real type specimens of *L. Grayana* and had called it *Labordia Hedyosmifolia.* Skottsberg (Meddel. Göteborgs Bot. Trädgård 10: 156. 1936) cites five names proposed by Baillon and states: "Not one of these names is accompanied by a description. Some are vaguely characterized with a few words, but in no case sufficient for anybody who does not consult Remy's collection to know what Baillon understood by his species. His names are little more than nomina nuda." Skottsberg rejects Baillon's earlier *Labordia Hedyosmifolia* on principle, then, but does retain *L. Grayana* Hillebr. St. John (op. cit. 5) admits that one of Baillon's five species, namely *L. Echitis*, is a nomen nudum but adds: "The remaining four of Baillon's species. . . .have adequate descriptions, generally including habit, stipules, leaves, inflorescences, and flowers." St. John remarks that "Baillon's types are all collections by J. Remy from the Sandwich Islands. The specimens are adequate, all but one were labeled by Baillon, and all are available for study in the herbarium of the Museum Nationale d'Histoire Naturelle at Paris." St. John accepts *L. Hedyosmifolia* Baill. Nor do the International Rules permit any other course, for, after all, Baillon's description was a description, even if unorthodox in its presentation.[1]

Labordia Hedyosmifolia var. ζ **Skottsbergii** Sherff, Amer. Journ. Bot. 25: 584. 1938; *Labordia Grayana sensu* Skottsb. *pro parte*, Meddel. Göteborgs Bot. Trädgård 10: 158, *fig. 19, a–c.* 1936.

---

[1] As to Skottsberg's criticism regarding the necessity of consulting the Remy types for the comprehension of Baillon's specific concepts, we may lodge a like criticism against numerous authors, particularly the pioneers (who wrote when "species" were few and hence seemed sufficiently well described with a few words or lines) and some of the modern writers working in large genera. Fortunately, we have for the present numerous types on which to rely. With the lapse of time, however, and the destruction of many of these types by use, insects, fires, floods, etc., the need for full and carefully drawn descriptions will become ever more urgent.

Terminal internodes hispid. Leaves petiolate, petiole 1–2 cm. long; blade obovate or cuneate-obovate, subabruptly rounded and almost sub-acuminate at apex, along veins beneath moderately elsewhere sparsely appressed-hispid, 6–11 cm. long and 3.5–5.2 cm. wide. Inflorescence open, hispid, ±5-flowered. Calyx 1.2–1.5 cm. tall; sepals oblong-lanceolate, 3–7-nerved, glabrous or glabrate. Corolla scarcely 2 cm. tall.

Type specimen: Collected by *Carl Skottsberg*, no. 590, in forest above Pahala, south slope of Mauna Loa, Hawaii, September 19, 1922 (Bish.).

Distribution: Known only from type locality in southern Hawaii.

Specimens examined: *Skottsberg* 590 (type, Bish.: cotype, Goth.; staminate and fruiting).

The type had been determined by Skottsberg as *Labordia Grayana* Hillebr. (cf. Meddel. Göteborgs Bot. Trädgård 10: 157. 1936). It differs at once, however, in having leaf blades hispid (not glabrous) below, and much larger (6–11 cm. long and 3.5–5.2 cm. wide, not 4–8 cm. long and 2–3.5 cm. wide), also branches of inflorescence and terminal internodes of branchlets hispid (not glabrous).

Labordia Hedyosmifolia var. *η* **kilaueana** Sherff, Amer. Journ. Bot. 25: 585. 1938.

Similar to var. *Rockii*. Terminal internodes of branchlets glabrous. Leaves elliptic-oblong or more rarely oblong-oblanceolate, at apex subacute, on both surfaces glabrous, blade 3–5.5 cm. long and 1.3–2 cm. wide, petiole 2–6 mm. long. Inflorescence (flowers unknown) finally glabrous, contracted, in fruit less than 4 cm. across. Sepals linear-lanceolate, 3–7-nerved, at apex acute, dorsally glabrous, finally 7–13 mm. long. Capsular valves scarcely 1.5 cm. long including crests.

Type specimen: Collected by *Francis Raymond Fosberg*, no. 10,102, shrub 1 meter tall, in wet forest, alt. 810 meters, between Makaopuhi and Napau Craters, Chain of Craters, Kilauea, Hawaii, August 29, 1933 (Bish.).

Distribution: Known only from type locality in southeastern Hawaii.

Specimens examined: *Fosberg* 10,102 (type, Bish.: cotype, Field; fruiting).

Labordia Hedyosmifolia var. *θ* **magnifolia** Degener & Sherff, var. nov.

Ramuli glabri. Folia ut in var. *Grayana* sed majora et magis membranacea, petiolo usque ad 2 cm. longo, lamina 8–11 cm. longa et 3.5–5 cm. lata. Sepala paulum angustiora et longiora quam pro var. *Grayana.*

Branchlets glabrous. Leaves as in var. *Grayana* but larger and more membranaceous, the petiole up to 2 cm. long, the blade 8–11 cm. long and 3.5–5 cm. wide. Sepals slightly narrower and longer than in var. *Grayana.*

Type specimen: Collected by *Otto Degener,* no. 1,599, perhaps at Kilauea, Hawaii, in 1922 or 1923 (Field).

Distribution: Eastern Hawaii. The type label had been lost but the collector wrote on sheet, "either from Kilauea, or possibly from Pauoa Flats, Oahu." In view of the recent rediscovery of this variety on Hawaii, it seems probable that the type came from Kilauea.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 3,256, in fern forest, "23 miles," along road, Hilo-Kilauea, September 13, 1938 (Goth.; pistillate); *Degener* 1,599 (type, Field; post-flowering).

The type has a loose, glabrate inflorescence about 5 cm. across. The slender sepals are mostly 1.5–1.7 cm. long and apically acute. The leaves are notably thin and pallid. They suggest those of var. ζ *Skottsbergii,* a variety differing at once in the hispid terminal internodes of its branchlets.

Labordia Hedyosmifolia var. ι **Hosakana** Sherff, Amer. Journ. Bot. 25: 584. 1938.

Branches numerously nodose, branchlets angulate and densely tomentose-hispid; stipules ±4 mm. tall, externally hispid and herbaceous below but glabrate and hyaline above. Petioles densely hispid and 3–10 mm. long; blades now short-ovate now obovate, on upper surface glabrous and impressedly nerved, on lower surface salient-nerved and more or less hispid along the nerves, at apex submucronate or acute or even rotund, at base rotund or more or less cuneate, at margins often irregularly revolute, commonly 1.5–6 cm. long and 1–3.4 cm. wide. Inflorescence sessile, umbellate-contracted, included by the leaves, 7–20-flowered. Sepals distinct, linear-oblong or linear-subulate, externally glabrate or sparsely white-setose, marginally subdiaphanous and often conspicuously ciliate, lengthwise 3–7-nerved, 7–14 mm. long. Corolla slender or slightly ventricose below, outwardly glabrous or sparsely setose, about 1.5–2.5 cm.

long, tube about 0.8–1.5 cm. long, lobes lanceolate and internally white-setose. Pedicel sparsely setose, ±6 mm. long, its bractlet very slenderly elongate-linear and 7–10 mm. long. Capsule globose-ovoid, 3-valved, the mature ovary glabrous and about 1 cm. long, style (rostrum) glabrous or sparsely setulose and about 3–4 mm. long; valves sharply carinate above. Staminate flowers not examined.

Type specimen: Collected by *Edward Yataro Hosaka*, no. 679, shrub 4 feet tall, on denuded ridge, alt. 2,500 feet, Kipapa Gulch, south ridge, Waipio, Koolau Range, Oahu, July 4, 1932 (Bish.).

Distribution: Kipapa Gulch to Aiea, Koolau Range, Oahu.

Specimens examined: *Degener, Park, Potter, & Bush* 10,152*a*, on wind-swept summit, Kipapa Trail, Koolau Range, June 2, 1935 (Berl.; Deg.; Field; Gray; Kew; pistillate, flowering and fruiting); *Degener, Salucop, & Arlantico* 11,553, on wind- and rain-swept summit, C. C. C. Trail, Aiea, December 6, 1937 (Deg.; Field; sterile); *Degener, Takamoto, & Martinez* 10,542, shrub 2 feet tall, at wind-swept summit, C. C. C. Trail, Aiea, March 15, 1936 (Deg.; Field, 2 sheets; subflowering); *Francis R. Fosberg* 9,729, on exposed ridge, alt. 860 meters, Kipapa Gulch, Waipio, August 6, 1933 (Field; flowering and fruiting); *Hosaka* 679 (type, Bish.: cotype, Field; flowering and fruiting).

This variety was named for Mr. Hosaka, who collected not only the type but also numerous other specimens of *Labordia*, all of which he very generously placed at my disposal. Some of the stems examined are closely invested with fine moss, and the whole habit is that of a very scraggly, dwarfed, much branched shrub. The umbellate-contracted, numerously flowered inflorescence and tomentose-hispid branchlets give an appearance suggestive of *Labordia Fagraeoidea* var. *sessilis*. The more often ovate and usually shorter, irregularly revolute leaves of var. *Hosakana*, however, also their more conspicuous venation and the elongate, narrow, frequently ciliate, acute sepals separate it satisfactorily from that variety. By some botanists, the Hosaka type might be taken to represent a new species (and by myself it was indeed so considered originally). With *L. Hedyosmifolia*, however, it is joined most conclusively through *L. Hedyosmifolia* var. *centralis*, a variety present on Maui, Molokai, and Lanai, but absent on Oahu, and offering within its range of variations many close counterparts to the several *facies* observable in var. *Hosakana*.

7. **Labordia venosa** Sherff, Amer. Journ. Bot. 25: 579. 1938.

Shrubby or perhaps becoming a tree; branchlets subterete, brownish-gray, toward their tip (for 1–4 internodes) antrorsely and arcuately appressed-setulose, elsewhere glabrous. Leaves delicately petiolate; petiole submarginate, hispidulous, 0.8–1.5 cm. long; blade obovate or obovate-oblong, at margins subrepand-entire, at base gradually at apex more or less abruptly narrowed, 6–10 cm. long and 2–4.5 cm. wide, numerously and conspicuously veined, coriaceous and subglabrous above, on lower surface conspicuously hispidulous along both large and small veins but elsewhere glabrous. Stipules auriculoid, intrapetiolar, conspicuous, 2–4 mm. tall. Inflorescence terminal, sessile, compact, 3–4 cm. in diameter at flowering, in fruit 4–6 cm. in diameter, 10–30-flowered; ultimate pedicels noticeably hispid, at flowering ±2 mm. but in fruit up to 1 (rarely 1.5) cm. long. Calyx pubescent below, glabrous above, 4–6 cm. long, deeply (almost to the base) 5-lobed; lobes linear-lanceolate or linear-oblong, 1–2 mm. wide, at apex obtuse or subacute. Corolla about 1 cm. long, very sparsely pubescent outside, 5-lobed, the linear lobes acute and 4–5 mm. long, tube up to 3.5 mm. thick. Capsule black, 2-merous, (1–) 1.2–1.6 (rarely–1.8) cm. long; valves outwardly more or less puberulous, toward apex conspicuously carinate.

Type specimen: Collected by *Joseph F. Rock*, no. 8,627, Ukulele-Waikamoi, East Maui, October, 1910 (1st type sheet, Bish.; flowering material) and by *Charles Noyes Forbes*, no. 762–*M*, Ukulele, East Maui, July, 1919 (2nd type sheet, Bish.; fruiting material).

Distribution: Northeastern East Maui.

Specimens examined: *Otto Degener* 10,267, in rain-forest, Pipe-line Trail, Olinda, June 26, 1927 (Field; fruiting); *Degener* 10,268, same locality, June 20, 1927 (Deg.; Field; fruiting); *Degener* 10,270, same locality June 27, 1927 (Berl.; Deg.; Field; fruiting); *Degener & D. LeRoy Topping* 10,263, same locality, July 30, 1927 (Deg.; Field; subflowering); *Charles N. Forbes*, Keanae Gap, Haleakala Crater, August 7, 1919 (Bish.); *Forbes* 152–*M*, woods near Ukulele, above Olinda, July, 1910 (Bish.; fruiting); *Forbes* 637–*M*, Keanae Pali, east of Ukulele, July 17, 1919 (Bish.; sterile); *Forbes* 760–*M*, Ukulele, July, 1919 (Bish.; subflowering and post-fruiting); *Forbes* 762–*M* (Bish., 2nd type sheet; fruiting); *Forbes* 882–*M*, east of Ukulele, July 20, 1919 (Bish.; sterile); *Forbes* 888–*M*, same locality, July 21–23, 1919 (Bish.; fruiting); *Forbes* 963–*M*, Ukulele, July 27, 1919 (Bish.; Field; fruiting); *Forbes* 1,080–*M*, Keanae Gap, Haleakala, August 7, 1919 (Bish.; subflowering); *Forbes* 1,237–*M*, north slope of Haleakala, August 23, 1919 (Bish.; Field; fruiting); *Forbes* 1,253-*M*, Ukulele, August 4, 1919 (Berl.; Bish.; Field; Gray; variously staminate and pistillate); *Joseph F. Rock* 8,538, Honomanu, September, 1910 (Bish.; pistillate); *Rock* 8,627 (Bish., 1st type sheet; Mus. V.; staminate).

The specimens studied had been determined as *L. Grayana* Hillebr., which reduces to *L. Hedyosmifolia* var. *Grayana*. From *L. Hedyosmifolia* and its varieties, especially the sometimes simulating var. *centralis*, it differs in numerous characters of foliage, flowers, and fruits, but can be distinguished perhaps most easily by its lower leaf surfaces. These have a conspicuously reticulate venation, often with 15–25 principal veins on each side of the midvein. While the areolae of lower leaf-surface enclosed within the reticulations are glabrate, the lower surfaces of the veins themselves are densely hispid with short, curved, sharp, closely investing setae.

Forbes 152-*M*, from woods near the type locality, differs from the other fruiting specimens cited in having capsules barely 1 cm. long and pedicels mostly about 1.5 cm. long. Enough evidence to warrant varietal segregation, however, seems lacking.

8. **Labordia Wawrana** Sherff, Amer. Journ. Bot. 25: 579. 1938.

Branches brownish-gray, subterete, nodes often numerous, stipules distinct; terminal internodes densely hispidulous, drying subangular and reddish-black. Leaves disposed at and near ends of branchlets, oblong-oblanceolate, at apex subabruptly acuminate, membranaceous, glabrous above, hispidulous beneath, 1–2 dm. long and 3–6 cm. wide, with ±20 principal lateral veins to each side, more often gradually narrowed into a margined petiole, this hispidulous and commonly less than 1 cm. long. Inflorescence cymose, 15–30-flowered, conspicuously hispid, cernuous. Flowers (only the staminate known) slender. Calyx hispid, deeply cut often to the very base, 10–12 mm. long, lobes linear-subulate. Corolla white-hispid with short hairs outside and long ones inside; tube 11–16 mm. long and commonly 2–3.5 mm. thick; lobes linear-subulate, 8–9.5 mm. long. Anthers oblong-linear, about 2.5–2.7 mm. long. Pistillode about 13–14 mm. long; its style slender, densely (unless at top) spreading-setose, produced above the sepals into a very narrowly obconic stigma about 4.5 mm. long.

Type specimen: Collected by *Heinrich Wawra*, no. 2,200*b*, Waialeale, Kauai, between end of December, 1869, and May 1, 1870 (Mus. V., 2 sheets).

Distribution: Known only from type locality in central Kauai.

Specimens examined: *Wawra* 2,200*b* (2 type sheets, Mus. V.; staminate).

9. **Labordia mauiensis** Sherff, Amer. Journ. Bot. 25: 580. 1938.

Dwarf shrub ±3 dm. tall; branches sometimes prostrate and rooting, otherwise suberect; branchlets angulate and glabrous; stipules less than 2 mm. tall, often imperfectly connate. Leaves glabrous, gradually narrowed below to a petiolate base; petiole marginate, 3–10 mm. long; blade elliptic-oblanceolate, pallid, at apex subobtuse or subacute or rarely subacuminate, submembranaceous, when dry commonly revolute, 3–6.5 cm. long and 8–15 mm. wide; principal lateral nerves 4–6 to each side, subobscure above but moderately plain beneath. Inflorescence cymose-corymboid, not exserted, commonly 5–15-flowered, more often 2–3.5 cm. long and 3–4 cm. wide, glabrous (or sometimes loosely setulose upon the branchlets), bractlets linear and about 4 mm. long. Calyx deeply (almost or entirely to the base) cut, now glabrous now hispidulous; lobes oblong-linear or lanceolate, at apex obtuse or acute, 3–5-nerved, narrowly hyaline-margined, now (as on type) 4–6 now even 5–10 mm. long. Corolla outwardly glabrate or pubescent, inwardly white-hispid, tube 1–1.5 cm. long and 1–4 or even up to 6 mm. thick, lobes narrowly or widely lanceolate and 4–6.5 mm. long. Anthers linear, sterile about 2 mm. fertile about 2.2 mm. long. Pistillode about 13 mm. long; its ovary black when dry, conic, very sparsely setulose, about 5 mm. long; style filiform, hispid below, about 4–5 mm. long; stigmas narrowly obconic, papillate-pubescent, 3–4 mm. long. Pistil (immature) about 8 mm. long, ovoid-conic, toward base subglabrate, elsewhere conspicuously and densely erect-hispid, style not distinct.

Type specimen: Collected by *Joseph F. Rock*, Nahiku Stream, East Maui, May, 1911 (Bish.).

Distribution: Northeastern East Maui.

Specimens examined: *Otto Degener* 10,264, in dense, dark rain-forest, Pipe-line Trail, Olinda, June 21, 1927 (Berl.; Deg.; Del.; Field; Gray; Kew; Mo.; Mun.; Mus. V.; Par.; U.S.; pistillate); *Rock*, Nahiku Stream, May, 1911 (type, Bish.: cotypes, Gray; Mus. V.; staminate).

Rock had regarded this as a new species but did not describe it.

10. **Labordia glabra** Hillebr. Fl. Haw. Isls. 291. 1888.

a. Corolla externally glabrous or glabrate; sepals linear to ovate-lanceolate; plants native of Maui.

b. Capsule short-globose, about 1.2 cm. tall; plant of West Maui. *L. glabra sensu stricto.*

b. Capsule more elongate, ovoid, 17–19 mm. tall; plant of East Maui.................................var. *β orientalis.*

a. Corolla externally hispid; sepals broadly ovate; plant native of Oahu.................................var. *γ latisepala.*

Mostly glabrous; branchlets angulate, terminal 1 or 2 internodes at times sparsely setulose, stipules connected in an entire or emarginate ring. Leaves oblanceolate or even narrowly obovate, at times sparsely appressed-hispid underneath especially near veins, cuneately narrowed from middle into a slender sparsely hispidulous petiole 7–15 mm. long, at apex suddenly and distinctly acuminate, membranous, not pallid when dry, blade 7–14 cm. long and 2–4 cm. wide. Flowers solitary or perhaps at times 2 or 3; peduncle glabrous, 4–8 mm. long, beset above its base with 2 bractlets, these linear-lanceolate and about 6 mm. long. Calyx lobes subequal, linear-lanceolate or at fruiting ovate-lanceolate, glabrous, equaling corolla-tube in length. Corolla glabrous outside, puberulous inside; tube 7–10 mm. long and 4–5 mm. thick; lobes spreading-reflexed, 7–10 mm. long. Capsule short-globose, about 1.2 cm. tall, 3-valved, valves more or less incurved-rostrate at apex but not definitely carinate.

Type specimen: Hillebrand cited first Waihee and next Wailuku as the localities for this species. The Waihee sheet has two remaining sprays of flowering material, collected by Rev. J. M. Lydgate, Valley of Waihee, West Maui, August, 1870. The Wailuku sheet carries a collection number 139, doubtless of Hillebrand's own collecting, and bears three sprays of fruiting material. Hillebrand's description of the flowers clearly was based on the Waihee and, of the fruits, on the Wailuku specimens (Berl.).

Distribution: Northeasternmost part of West Maui.

Specimens examined: *Hillebrand,* Wailuku (2nd type sheet, Berl.; fruiting); *Lydgate,* Valley of Waihee, August, 1870 (1st type sheet, Berl.; flowering).

Labordia glabra var. *β* **orientalis** Sherff, Amer. Journ. Bot. 25: 588. 1938.

Capsule more elongate, ovoid, 17–19 mm. tall (including the 2–3.5 mm. long rostrum), valves now 3 now only 2; sepals mostly linear.

Type specimen: Collected by *Joseph F. Rock,* no. 10,344, Honomanu, northeastern East Maui, May, 1911 (Bish., 2 sheets).

Distribution: Eastern part of East Maui.

Specimens examined: *Charles N. Forbes* 1,644-*M*, ridge, left side of Kipahulu Valley, southeastern East Maui, November 15, 1919 (Bish.; post-fruiting); Rock 10,344 (2 type sheets, Bish.: cotype, Mus. V.; fruiting).

The Forbes material had been determined at Bishop Museum, apparently by Forbes himself, as a variety of *L. glabra* Hillebr., and the 2-valved capsule had been noted on the sheet ("capsule not 3-valved"). Rock had made a special study of his own no. 10,344 and determined it, under date of April 6, 1914, as *L. glabra* Hillebr. The elongate fruits are quite distinct, however, from the short, globose ones of the species proper (both type sheets of which are now before me). It is evident that the Rock and the Forbes specimens represent a geographic variety native to East Maui and easily recognized, at least when fruits are present, from the species proper of West Maui.

Labordia glabra var. γ **latisepala** var. nov.

Foliorum petioli glabri. Florae 2 vel 3; sepalis moderate lateve ovatis, margine diaphano ciliatoque latioribus, quam corollae extus albo-hispidae tubo plerumque brevioribus.

Leaf-petioles glabrous. Flowers 2 or 3; sepals moderately or broadly ovate, with the diaphanous and ciliate margin wider, commonly shorter than the outwardly white-hispid corolla-tube.

Type specimen: Collected by *Edwin H. Bryan, Jr.*, no. 837, a small tree 5-6 meters tall, flowers orange-yellow, in moist rainforest, alt. 2,300 feet, Kaluanui, Oahu, October 14, 1934 (Bish.).

Distribution: Known only from type locality in northeasternmost Oahu.

Specimens examined: *Bryan* 837 (type, Bish.: cotype, Field; pistillate).

11. **Labordia Cyrtandrae** Baill. *ex* Skottsb. Meddel. Göteborgs Bot. Trädgård 10: 156. 1936; cf. St. John, Occas. Paps. Bish. Mus. 12: no. 8: 5, and *pl. 1.* 1936; *Geniostoma Cyrtandrae* Baill., Bull. Soc. Linn. Paris 1: 239. 1880; *Labordia hypoleuca* Deg. Fl. Haw. fam. 302, Aug. 10, 1932; cf. St. John, op. cit. 10: no. 4: 4. 1933.

Leaves densely appressed-pilosulous beneath; sepals lanceolate, acuminate........................*L. Cyrtandrae sensu stricto.*

Leaves sparsely or on veins moderately to densely appressed-setulose beneath; sepals narrower, often almost filiformly narrowed from near base..............................var. *β nahikuana.*

Shrub 2–3 meters tall; young branches green, fleshy, terete, granular-puberulent or appressed-pilosulous; youngest nodes gelatinous; branches stout, the bark becoming smooth and brown; innovations from the uppermost axils below the inflorescence; stipules united into a sheath, 3–6 mm. tall, remotely ciliate, membranous, pointed or emarginate midway between the petioles; leaf-axils with many subulate glands, these 0.6–0.8 mm. long and white but blackening on drying. Leaf-petioles green, appressed-pilosulous, 1–5 cm. long and 3–8 mm. in diameter; blades broadly and at times somewhat obovately elliptic to ovate-elliptic, moderately or broadly cuneate at base, short-acuminate at tip, nearly glabrous and dark glossy-green above, below whitish and appressed-pilosulous, 7–26 cm. long and 2–14.5 cm. wide, the principal lateral veins 7–13 on each side and curved towards apex. Inflorescence a terminal, 2-forked, 8–82-flowered cyme, the recurved branches 1–4 cm. long and, like the pedicels, appressedly and antrorsely pilosulous with whitish hairs; bractlets 3–6 mm. long, linear, white-pilosulous; flowers sessile or on pedicels, these thickened towards the tip and 1–17 mm. long. Sepals 5–6, pale green, lanceolate, acuminate, unequal, pilosulous, 6–11 mm. long, the tips somewhat convolute. Corolla in bud convolute (the lobes closed to the apex), pale greenish-yellow, shading to whitish at base, glabrous or slightly pilosulous without, sparsely pilosulous within the tube and the base of the lobes, 2.6–3.7 cm. long; tube cylindric, 1.5–2.3 cm. long and 3–5 mm. in diameter; the five lobes reflexed, subulately linear-lanceolate, 8–13 mm. long; anthers lanceolate, pale yellow, attached from their median points to the base of the sinuses of the corolla lobes, 3–4 mm. long, their tip with a stout ovate apiculation, the base cleft one-fourth of the length. Pistillode about 2 cm. long; its ovary subulate, gradually tapering above, with a hispid band just above the middle; style glabrous, about 4 mm. long; stigma 7 mm. long, clavate, 2 mm. thick, green, white-hispidulous especially towards tip, often also with a faint crease towards tip. Capsule fusiform, terete or nearly so, bivalved, 1.8–5 cm. long and 8–12 mm. thick, valves carinate near apex, the acute rostrum flattened perpendicular to the septum (and appearing as an extension of the valvular keels) and extending 5 mm. or more beyond the tip of the locules, the dehiscence loculicidal from the tip or from both the tip and the base; seeds imbedded in a yellowish pulp, asymmetrically ovoid, white or pale brown, 2.5–3.5 mm. long, their testa with a conspicuous light cellular network, the hilum linear and nearly as long as the flattened side of the seed.

Type specimen: Collected by *Jules Remy*, no. 358*bis*, on mountains, Oahu, April, 1855 (Par., 2 sheets).

Distribution: Northeastern Oahu, in the Koolau Mountains.

Specimens examined: *Otto Degener, K. Park, & Y. Nitta* 4,174, in wet forest, at summit of Pig-God Trail, Punaluu, June, 1932 (Deg., 4 sheets; Field, 2 sheets; type and cotypes of *L. hypoleuca* Deg.; staminate and subfruiting); *Degener, Park, Colin Potter, William Bush, & D. LeRoy Topping* 10,000, in wet, forested gully, Kipapa Trail to Koolau summit, June 2, 1935 (Deg., 2 sheets; Field; staminate); *iidem* 10,001, on rich, wet slope in rain-forest, west of Poamoho Trail, Laie, August 25, 1935 (Deg.; Field; sterile); *Degener, K. Park, & Gordon Shigeura* 10,017, in wet, shady glen, Waimano Trail near summit, Koolau Range, October 6, 1935 (Deg.; Field; sterile); *Degener, Park, Bush, Potter, & Topping* 10,021, in woods near summit, Anahulu Trail, Koolau Range, June 16, 1935 (Deg.; staminate); *Charles N. Forbes*, Koolauloa Mts., between Punaluu and Kaipapau, November 14–21, 1908 (Bish.; staminate); *Forbes*, Makaha Valley, February 12–19, 1909 (Field; subflowering); *Forbes & C. L. Thompson*, same locality, May 3–8, 1909 (Berl.; Field; Gray; Kew; Mo.; Par.; staminate); *Francis R. Fosberg* 9,551, bush 1.5 meters tall, alt. 450 meters, in wet forest, Kipapa Gulch, Waipio, June 12, 1933 (Bish.; Field; staminate); *Fosberg* 10,345, bush 1 meter tall, alt. 430 meters, in wet forest at bottom of gulch, ridge southeast of Maakua Gulch, Koolau Mts., Hauula, October 15, 1933 (Bish.; Field; fruiting); *Fosberg* 14,234, shrub 4 dm. [sic!], leaves pallid beneath, flowers pale yellow, in dense shade, wet forest, alt. 450 meters, Laie Trail, Kahawainui Ihiihi, Laie, Koolau Mts., July 24, 1937 (Field; staminate); *William Hillebrand*, Wahiawa, April (Berl., *sub nom. L. membranacea* Mann.; subflowering); *E. Y. Hosaka*, shrub 5 feet tall, in moist gully, alt. 1,500 feet, Waikakalaua Gulch, Koolau Mts., April 6, 1930 (Bish.; Field; subflowering); *Hosaka* 602, in moist gully, alt. 1,500 feet, Kipapa Gulch, south ridge, Koolau Mts., July 4, 1932 (Berl.; Bish.; Field; Kew; staminate and subfruiting); *Hosaka* 1,002, shrub 4 feet tall, in wet gully, alt. 1,700 feet, Kipapa Gulch, Koolau Mts., May 6, 1933 (Berl.; Bish.; Field; Gray; subflowering and post-fruiting); *Hosaka* 1,062, shrub 5 feet tall, alt. 1,500 feet, Kipapa Gulch, 2nd north fork, Koolau Mts., June 11, 1933 (Bish.; Field); *Hosaka* 1,063, shrub 4 feet tall, in wet gully, alt. 1,500 feet, south ridge, Kipapa Gulch, Waipio, Koolau Mts., July 4, 1932 (Bish.); *Remy* 358*bis* (Par., one of two type sheets; subflowering; the other type sheet known to me only through St. John's plate made from it); *Harold St. John* 10,464, shrub 8 feet tall, on wet, wooded slope, alt. 1,600 feet, Waikakalaua Gulch, Koolau Mts., April 6, 1930 (Berl.; Bish.; Del.; Field; Par.; pistillate); *Harold St. John & Edward Yataro Hosaka* 10,567, same place, September 14, 1930 (Berl.; Bish.; Del.; Field; Gray; Kew; Par.; fruiting); *Heinrich Wawra* 2,252, Oahu, 1868–71 (Mus. V.; subflowering).

Additional specimens studied and cited by St. John but not available to me are: *Edward P. Hume* 558, shrub 10 feet tall, in small wet valley, near trail, alt. 1,800 feet, Kaluanui-Punaluu Divide, Kaluanui, Koolau Mts., May 8, 1932.

St. John's full description, based upon "abundant material of this species," has been reproduced here with few modifications. St. John appears to have overlooked the undoubtedly dioecious habit of the flowers. He ignored their unisexuality (cf. Skottsberg, Meddel. Göteborgs Bot. Trädgård 10: 153. 1936: "flowers which, to judge from the anthers . . . seem to be staminate in St. John's" [specimens]). His description apparently was drawn from staminate material at anthesis (although he cited flowering material which is seen to be pistillate) and from pistillate material in fruit. His description of the pistil refers in truth to the pistillode instead.

Labordia Cyrtandrae var. β nahikuana var. nov.

Folia plerumque paulo minora angustioraque, apice interdum magis attenuato-acuminata, infra sparsim vel secundum venas moderate denseve adpresso-setulosa; sepalis angustioribus, saepe basi excepta fere filiformi-angustatis; inflorescentiae ramorum setulis brevioribus ac minus perspicuis. Corolla circ. 2 cm. longa, lobis lanceolatis et circ. 7–8 mm. longis. Capsula ignota.

Leaves averaging somewhat smaller and narrower, at times more attenuate-acuminate at apex, sparsely or on veins moderately to densely appressed-setulose beneath; sepals narrower, from shortly above base often almost filiformly narrowed; branches of inflorescence with shorter and less conspicuous hairs. Corolla about 2 cm. long, its lobes lanceolate and about 7–8 mm. long. Capsule not seen.

Type specimen: Collected by *Joseph F. Rock*, Nahiku, East Maui, May, 1911 (Gray).

Distribution: Northeasternmost East Maui.

Specimens examined: *Charles N. Forbes* 244–*M*, Nahiku, July, 1910 (Bish.; Field; sterile); *Joseph F. Rock*, Kailua Ditch, Honomanu, May, 1911 (Bish.; Gray; staminate); *Rock*, Keanae, perhaps same date (Field; subflowering); *Rock*, Nahiku, May, 1911 (type, Gray: cotype, Bish.; subflowering).

Rock (in herb.) had construed the Nahiku specimens as representing a new species and the other specimens as representing still another new species. The Nahiku material is seen to be only varietally distinct, however, from *Labordia Cyrtandrae*, a species unknown at the time to Rock. The remaining specimens exhibit variations in certain respects, but a comparative study of *L. Cyrtandrae* proper reveals much the same variations and indicates the unwisdom of attempting to segregate the Honomanu and Keanae plants from the Nahiku plants.

12. **Labordia Baillonii** St. John, Occas. Paps. Bish. Mus. 12: no. 8: 9, *pl. 4.* 1936; *Labordia Echitis* Baillon, Bull. Soc. Linn. Par. 1: 239. 1880 (nom. nudum).

Shrub(?); branches stout, somewhat tetragonal; bark smooth, yellowish; stipules chartaceous, intrapetiolar, united into a loose sheath 3–5 mm. tall. Leaf-petioles 1–2 cm. long, above glabrous and grooved, beneath more or less hirsutulous; blades firm-chartaceous, elliptic-ovate, at apex abruptly subacuminate, at base cuneate and tapering to the petiole, marginally entire, below paler green and sparsely subappressed-hirsutulous, 7–10.5 cm. long and 3.2–5.8 cm. wide. Inflorescence a terminal cyme, sessile, about 4–5 cm. tall, 15–18-flowered, sparsely hirsute; bractlets linear, tapering, 2–5 mm. long; pedicels 4–14 mm. long, hirsute, especially at apex. Sepals 5 or 6, 4.5–7 mm. long and two-thirds to three-fourths the length of the corolla-tube, somewhat hirsutulous towards base, outer ones 2–2.5 mm. wide, ovate-lanceolate below, long-acuminate above, palmately 5–7-nerved, the marginal nerves heavy and prominent towards tip; inner ones 1–1.5 mm. wide, lanceolate below, long-acuminate above. Corolla yellowish(?), firm, glabrous outside, sparsely hirsutulous inside at base of lobes; tube 7–11 mm. long, about 2 mm. in diameter, slightly contracted below the throat, the 5 lobes 8–10 mm. long, lanceolate-linear. Anthers narrowly oblong, acutely pointed at apex, 3.5–4 mm. long. Pistillode about 1.5 cm. long, slender-fusiform at base, with a slender style and a narrowly ellipsoid and papillose apex. Pistillate flowers and fruits unknown.

Type specimen: Collected by *Jules Remy*, no. 363*bis*, Island of Hawaii, 1851–55 (Par.).

Distribution: Known only from Hawaii.

Specimens examined: See discussion following.

Material of this species does not appear to have been collected since Remy's time. Nor have I been able to find the type itself among the specimens in Paris, although the type was studied by St. John as recently as 1936. In the complete absence of representative material among the specimens of *Labordia* studied by me, I have been compelled to rely upon St. John's carefully detailed description and satisfactory half-tone plate (loc. cit.).

13. **Labordia membranacea** H. Mann, Proc. Amer. Acad. 7: 197 (Enum. Haw. Pl. 386). 1867.

Leaf-blades variously broad-oblong to obovate, 0.8–2.7 dm. long and 4–12.5 dm. wide; cyme usually 12–24-flowered; plant native of Oahu .... *L. membranacea sensu stricto.*

Leaf-blades oblongly or elliptically oblanceolate, 4–11 cm. long and 1.6–3.7 cm. wide; cyme 1–7-flowered; plant native of East Maui. var. *β exigua.*

Shrub about 2 meters tall or becoming a small tree; ultimate branches thick, herbaceous, terete to more or less angular, short-hispidulous with brown hairs. Stipules connected in a commonly entire ring. Leaves petiolate, petioles exalate, often stout, scurfy-pubescent, rufous, 0.6–2.5 cm. long; blades variously broad-oblong to obovate, apically acuminate, basally cuneate or rarely rounded, marginally subentire, 0.8–2.7 dm. long and 4–12.5 cm. wide, in living state rather fleshy and succulent, when dry membranaceous, dark green and shining or somewhat dull on glabrous upper surface, beneath pale and appressed-hispidulous with short and sharp, dark-rufous setulae, the principal lateral nerves more often 9–12 to each side. Cyme usually 12–24-flowered, subsessile, open or much contracted, with diverging branches, 3–5 cm. in diameter, viscous-pubescent or hirsute, dark-rufous; pedicels 2–3 mm. long at anthesis; bractlets capilliform-subulate, 1.5–3 mm. long. Calyx rufo-pubescent, about 6 mm. long, divided to near base into subequal linear or subulate lobes. Corolla externally and internally glabrous or sparsely setulose, pale-stramineous; the slender tube dilating above, 10–14 mm. long, the erect or spreading lobes half as long. Pistillode's stigmatic portion clavate, densely white-pubescent, about 5 mm. long and 1 mm. thick. Capsule ovoid-fusiform, 1.5–1.8 cm. thick, 2-valved; valves externally glabrous, distinctly carinate toward apex, about 3.8 cm. long exclusive of terminal rostrum (this 5–6 mm. long).

Type specimen: Collected by *Horace Mann* and *William T. Brigham*, no. 149, on mountains above Honolulu, Oahu, May 4, 1864–May 18, 1865 (herbarium not cited, but the Gray Herbarium and Cornell University specimens perhaps have equal claim to being considered as the type).

Distribution: "On the lee slopes of the Koolau Mountains from Nuuanu Valley eastward" (St. John, Occas. Paps. Bish. Mus. 10: no. 4: 6. 1933), Oahu.

Specimens examined: *Charles N. Forbes* 1,486-*O*, "lateral" on east side of Nuuanu Valley, March 22, 1910 (Bish.; Mo.; subflowering and fruiting); *Forbes* (with *J. C. Bridwell*) 2,438–*O*, on wet slope in dense shade, ridge, right-hand side, Waialae Iki, March 2, 1917 (Bish.; subflowering); *Francis R. Fosberg* 13,550, shrub 3 meters tall, in moist forest, alt. 500 meters, Cliff Trail, Koolau Mts., Manoa, January 17, 1937 (Bish.; Field; fruiting); *William Hillebrand*, Hawaiian Isls. (U. S.; staminate); *Hillebrand*, Palolo (Berl.; flowering and post-fruiting); *Hillebrand*, Pauoa, January, 1870 (Berl.; staminate); *Hillebrand*, Wailupe Valley, April, 1870 (Berl.; staminate); *Hillebrand & Rev. J. M. Lydgate*, Oahu (Bish.; staminate); *Hillebrand & Lydgate*, Wailupe (Bish.; pistillate); *Mann & Brigham* 149 (type collection, Corn.; Gray; subflowering); *Heinrich Wawra* 2,284, Oahu (Mus. V.; staminate).

For note as to Hillebrand's erroneous description of the capsule of this species, see under *L. olympiana* (p. 515).

The type description omits the capsules, nor does Mann's type material have them. It may be noted that Mann cited the "mountains above Honolulu" for the type station. I have therefore relied upon Forbes 1486–*O* for my description of the capsules. This collection was made on the east side of Nuuanu Valley, which extends directly and northeastwardly from the main part of Honolulu. The mature capsules have valves distinctly carinate toward their apex. In this respect they differ conspicuously from those of a form known to me definitely as yet only from the somewhat more distant Mt. Olympus, and which I must assume not to have been the form studied by Mann (*vide L. olympianam infra*).

Labordia membranacea var. *β* **exigua** Sherff, Amer. Journ. Bot. 25: 588. 1938.

Leaves smaller; petiole 0.5–3 cm. long; blade oblongly or elliptically oblanceolate, at apex acuminate, more or less gradually narrowed below middle all the way to the petiole, 4–11 cm. long and 1.6–3.7 cm. wide. Inflorescence 1–7-flowered. Calyx 7–8 mm. long. Capsule unknown.

Type specimen: Collected by *Joseph F. Rock*, Honomanu, East Maui, May, 1911 (Bish.).

Distribution: Northeastern East Maui.

Specimens examined: *Joseph F. Rock*, Waikamoi ditch trail, Ukulele, September, 1910 (Bish.; staminate); *Rock*, Honomanu, May, 1911 (type, Bish.; staminate).

Distinguished from the species proper by its smaller and proportionately narrower leaves.

14. **Labordia Degeneri** Sherff *ex* Degener, Fl. Haw. Aug. 24. 1938.

Leaves when dry a pallid bluish- or grayish-green; capsule compressed, its valves distinctly carinate nearly or quite to base.
L. Degeneri sensu stricto.

Leaves when dry brownish-green; capsule more or less obcompressed, valves weakly or obsoletely carinate toward apex but otherwise ecarinate.............................var. β subcarinata.

Shrub ±3 meters tall; branchlets gray, terete, at first hispidulous but finally more or less glabrate. Leaves disposed at ends of branchlets, the petiole variously 0.5–3 cm. long; blade more often oval or ovate, more rarely obovate, at apex abruptly contracted and acute or subacuminate, at base rounded or widely cuneate, glabrous above, sparsely or moderately appressed-hispid beneath, at least when dry a pallid bluish- or grayish-green, 2–8 cm. long and 1.5–4.3 cm. wide. Inflorescence sessile, umbellately contracted, more often 3–15-flowered, the bractlets very narrowly oblong-linear. Flowers subsessile. Calyx glabrate; lobes linear or acutely lanceolate, dorsally up to 5-nerved, marginally somewhat translucent, 5–8 (finally even 14) mm. long. Corolla outwardly glabrate; tube ±11 mm. long; lobes linear, spreading or reflexed, ±6 mm. long. Pistillode (mature) unknown. Pistil about 5.5 mm. long at anthesis; stigma slender-cylindric, ±2.8 mm. long, hispidulous on lengthwise ridges; style one-third as thick, glabrous, about 1 mm. long; ovary slenderly conic-ovoid, mostly glabrous. Capsule solitary at tip of branchlet, compressed (not obcompressed), in lengthwise outline cuneate-oblong or toward apex subobtusely and arcuately narrowed, glabrate, not shiny, about 3 cm. long, 2-valved; valves medianly carinate on dorsal surface (unless toward base), at apex very shortly rostrate, rostrum only about 1–2 mm. long.

Type specimen: Species based on two type sheets. First sheet (subflowering material): *Otto Degener*, no. 10,248, Waineke Swamp, Kokee, Kauai, July 1, 1926 (Field). Second sheet (fruiting material): *Degener*, no. 10,252, in wet ravine, Kokee Camp, Kauai, June 25, 1926 (Field).

Distribution: Northwestern Kauai.

Specimens examined: *Degener* 10,248 (type, 1st sheet, Field: cotype, Deg.; pistillate); *Degener* 10,252 (type, 2nd sheet, Field; fruiting); *Degener* 10,256, in rain-forest, Kokee Camp, June 23, 1926 (Berl.; Deg.; Field; Gray; fruiting); *Degener* 10,257, "almost certainly Kauai," summer, 1926 (Deg.; Field; subflowering); *Mrs. Juliet Wichman* 2,940, Kalalau Trail, Kokee region, August 15, 1938 (Goth.; fruiting).

The two mature capsules on the second type sheet are brownish-black. A third capsule, somewhat less mature, is on the same sheet. This is distinctly pallid. The capsules are much the largest for the several Kauai species of *Labordia*, being approached in size only by the carinate-valved capsules of the habitally very different *Labordia Helleri* var. *macrocarpa*. This exceedingly interesting species was dedicated to Otto Degener, in grateful recognition of the important part which his numerous specimens of *Labordia* had played in facilitating my monographic research upon the genus.

Labordia Degeneri var. *β* **subcarinata** var. nov.

Folia sicca brunneo-viridescentia infra paulo hispidiora setis saepe brevioribus. Capsula paulo brevior, plus minusve obcompressa, valvis extus interdum plus minusve subnitidis, apicem versus aegre obsoleteve carinatis aliter ecarinatis, 2–2.6 cm. longis.

Leaves becoming brownish-green when dry, somewhat more hispid beneath with often shorter setae. Capsule a little shorter, more or less obcompressed, its valves at times more or less subglossy externally, weakly or obsoletely carinate toward apex elsewhere ecarinate, 2–2.6 cm. long.

Type specimen: Collected by *Charles N. Forbes*, no. 980–*K*, in Waimea Drainage Basin, west side, July 3 to August 18, 1917 (Bish.).

Distribution: Northwestern Kauai.

Specimens examined: *Forbes* 346–*K*, Kaholuamanu, September, 1909 (Bish.; Field; Gray; staminate); *Forbes* 980–*K*, (type, Bish.; fruiting); *Forbes* 987–*K*, Waimea Drainage Basin, west side, July 3–August 18, 1917 (Bish.; Field; Mo.; subflowering); *Forbes* 1,044–*K*, Kalalau Trail, same locality and date (Bish.; subflowering); *Francis R. Fosberg* 12,676, shrub 3 meters tall, fruits [immature] white, under side of leaves pallid, in wet forest, alt. 1,250 meters, plateau at head of Kalalau Valley, December 29, 1935 (Field; subfruiting); *Joseph F. Rock* 5,247, Kaholuamanu, September, 1909 (Bish.; subflowering); *Rock* 5,916, same locality and date (Bish.; staminate); *Olof H. Selling* 3,101, Nualolo Trail, Kokee region, August 21, 1938 (Goth.; fruiting).

Through this variety, *L. Degeneri* makes an illusory approach to *L. pallida* var. *hispidula* of the same region. Var. *subcarinata* differs, however, in having leaves proportionately shorter, broader, more rounded and less attenuate-elongate at each end, drying more of a brownish-green instead of a yellowish-green, much less densely and finely hispid on lower surface (in *L. pallida* var. *hispidula* the midribs have, underneath their proximal half, as many as 15–30 setulae abreast, while in var. *subcarinata* this portion of the midrib is sparsely hispid, with 1–5 setae abreast); also in having capsular valves definitely though somewhat inconspicuously carinate toward apex.

15. **Labordia olympiana** Sherff, Amer. Journ. Bot. 25: 580. 1938; *Labordia membranacea* sensu Rock, Indig. Trees Haw. Isls. 405, *pl. 164.* 1913 (non Mann).

Small tree, 3–5.5 meters tall. Leaves similar to those of *L. membranacea* but perhaps less hispid with brown or dark-rufous setulae, at base more rounded, at apex less attenuated. Inflorescence few-flowered, flowers similar to those of *L. membranacea;* calyx 8–11 mm. long. Capsule bivalved, variously conic-ovoid or ovoid-fusiform or cylindric-ovoid, 2–4 cm. long and 1.1–1.8 cm. thick; valves ecarinate, at apex not or very obsoletely rostrate.

Type specimen: Collected by *Joseph F. Rock,* Mt. Olympus Trail, Oahu, 1912 (Bish., 2 sheets).

Distribution: Southeastern Oahu.

Specimens examined: *Rock,* Mt. Olympus Trail, 1912 (2 type sheets, Bish.; flowering and fruiting).

Rock (loc. cit.) included this form with *L. membranacea* Mann. His "three-flowered cyme," "valves not ridged at the back," and "Mt. Olympus trail, where it is a small tree 10 to 18 feet in height" are clearly taken from the data pertaining to the 2 type specimens of *L. olympiana.* His description of the calyx-lobes as being 1.5 cm. long is doubtless a misprint. The entire calyx of *L. olympiana* is under 11 mm. long (and in *L. membranacea* it is only ±6 mm. long).

Hillebrand (Fl. Haw. Isls. 292. 1888) seems to have been unfamiliar with this species. His description of the capsule of *L.*

membranacea Mann would falsely appear *per se* to have been drawn really from *L. olympiana's* capsule. On this point, however, his herbarium specimens of *L. membranacea* (Berl.) are conclusive. Only his Palolo specimen has any fruit at all and this a single rudiment of a year previous to that of collecting. The inflorescence had produced 3 capsules. Of these the reticulated fibrovascular system of the mostly disintegrated exocarp remains, *capped in each case by a rudiment of the capsular rostrum.* In one instance the *membranous interior shell of the capsule* persists and is evidently the basis for Hillebrand's misleading description of the capsule for *L. membranacea:* "conico-elongate, about 12 lines in height, the pergameneous valves not ridged at the back."

More material of *L. olympiana* is much to be desired, that the foliar and floral characters, as distinguished from those of *L. membranacea,* may be more closely drawn.

16. **Labordia hirtella** H. Mann, Enum. Haw. Plants no. 385 (Proc. Amer. Acad. 7: 196). 1867.

a. Leaves glabrate or finally very glabrous.
  b. Principal leaves mostly under 8 cm. long and 2.5 cm. wide; plant native of Molokai........................var. *η laevis.*
  b. Principal leaves mostly over 10 cm. long and 3 cm. wide; plant native of East Maui.....................var. *ε haleakalana.*
a. Leaves pubescent beneath, at least along the veins.
  b. Calyx-lobes more or less ovately dilated at base.
    c. Calyx glabrate; plants natives of Hawaii and Molokai.
      d. Upper half of sepals capilliform-subulate. var. *δ microcalyx.*
      d. Upper half of sepals linear-subulate to triangular-lanceolate.
        e. Leaves densely hispidulous beneath with very short hairs; plant native of Hawaii........var. *θ imbricata.*
        e. Leaves sparsely appressed-setose beneath with rather long, shining hairs; plant native of Molokai. var. *ι laevisepala.*
    c. Calyx pubescent; plant native of East Maui. var. *ε haleakalana.*
  b. Calyx-lobes not or but slightly dilated at base.
    c. Leaf-blades 2.5–6 cm. long and 1–2 (–2.6) cm. wide.
      d. Leaves mostly oblanceolate and rather narrowly so, densely fine-pubescent beneath; calyx externally more or less pubescent...................var. *β microphylla.*

d. Leaves obovate or at times oval-oblong to ovate, sparsely setulose beneath or glabrate except along veins; calyx glabrous or glabrate.................... var. γ *sororia.*

c. Leaf-blades commonly (and at least when membranous) larger, 6–12 cm. long and 2–4.3 cm. wide.

d. Leaf-blades mostly obovate or oblanceolate.

e. Calyx pubescent................ *L. hirtella sensu stricto.*

e. Calyx glabrous...................... var. ι *laevisepala.*

d. Leaf-blades ovate-oblong or scarcely oblong-subobovate; calyx glabrous or glabrate .... var. ζ *hispidior.*

Shrub or small tree, irregularly much branched; branchlets slender, sharply angular or even subalate, pubescent or all but terminal 1 or 2 internodes usually becoming glabrate; stipules low and highly variable. Leaves mostly obovate or oblanceolate more rarely oval or widely elliptic; petiole hispid, 2–15 mm. long; blade glabrate above, pubescent and pale beneath, at apex short-acuminate, below middle more or less cuneately narrowed, now coriaceous and small (3–6.5 cm. long and 1.2–2.5 cm. wide) now membranous and larger (up to 12 cm. long and to 4.3 cm. wide). Cyme 3–9 (in Molokai material to 20)-flowered, open and loose, its spreading-hispid branches rather long and slender and mostly reflexed, ultimate pedicels mostly 3–7 mm. long at anthesis, their slender filiform-linear pubescent bractlets about 4 mm. long. Calyx pubescent, 0.3–0.5 the length of the corolla-tube, cleft to the base into the 5 linear-lanceolate (or even filiform-linear) finely acuminate or subulate lobes, these at anthesis 4–7.5 (–9) mm. long. Corolla pale yellow, glabrous outside and inside, the tube 10–12 (–16) mm. long, the slender acute lobes about 5–6 (–10) mm. long. Pistillode's style very filiform and protruding 6–8 mm. above calyx, ending abruptly in the narrowly obovoid stigma, this about 2 mm. long. Capsule ovoid-elongate, somewhat conical toward apex, 2-valved, minutely and subsparsely appressed-hispidulous, 2.3–2.7 cm. long (including the stylar beak of 2–3 mm.) and 8–10 mm. thick, valves rounded and not carinate.

Type specimen: Collected by *Horace Mann* and *William T. Brigham*, no. 335, on the summit of Lanai, 1864–1865 (herbarium not cited; the Gray Herbarium and Cornell University Herbarium specimens would of course have best claims to being considered the type, although this is of little consequence, since the various specimens of the type number, 335, are identical).

Distribution: Lanai, eastern Molokai, and Maui.

Specimens examined: *Otto Degener* 10,273, shrub 2–4 feet tall, in rain-forest, Mapulehu, almost overlooking Wailau Valley, Molokai, June 9, 1928 (Berl.; Deg.; Field, 2 sheets; fruiting); *Degener* 10,277, in rain-forest, East Fork of Kawela Gulch, Molokai, June 11, 1928 (Field; subfruiting); *Charles N. Forbes* 369–*L*, Lanai, September, 1917 (Bish.; sterile); *Forbes* 2,544–*M*, Halehaku Ridge, right side of valley, northern East Maui, June 16, 1920 (Bish.; sterile); *Forbes* 2,586–*M*, west bank of Honomanu Gulch, northeastern East Maui, June 23, 1920 (Field; staminate); *Forbes* 2,588–*M*, trail up west bank of Honomanu, same date (Bish.; Field; staminate); *William Hillebrand*, Hawaiian Isls. (Mus. V.; subflowering); *Hillebrand*, Lanai, 1870 (Berl.; Gray; staminate); *Hillebrand*, Lanai, July, 1870 (Berl.; staminate); *Hillebrand*, Molokai (U. S.; subflowering and fruiting); *Hillebrand*, Molokai, 1870 (Gray; subflowering and fruiting); *Hillebrand*, heights near Pali of Pelekunu, Molokai, July, 1870 (Berl.; fruiting); *Hillebrand*, Maunahui, Molokai, June, 1870 (Berl.; subflowering); *Hillebrand & Rev. J. M. Lydgate* 97, West Maui (Bish.; staminate); *Mann & Brigham* 335 (type collection: Corn.; Gray; Mo.; U. S.; flowering and fruiting); *George C. Munro* 237, Lanaihali, Lanai, June 29, 1915 (Bish.; staminate); *Joseph F. Rock*, Molokai (Bish.; staminate); *Rock*, Wailau Pali, Molokai, 1910 (Mus. V.; fruiting); *Rock* 7,045, alt. 2,750 feet, dense forest, Wailau Pali, Molokai, April 15, 1910 (Bish., 2 sheets; Gray; fruiting); *Rock* 7,069, stunted shrub 4–5 feet tall, trail to Wailau Pali, Molokai, April, 1910 (Bish., 2 sheets; Gray; Mus. V.; subflowering).

At first sight, the Molokai material seems varietally distinct from Mann and Brigham's type collection on Lanai, in having larger leaves and larger and more numerous flowers (12–20 in a cyme instead of 3–11). Hillebrand, however, collected a perfectly connecting range of intermediate specimens on the small type island, Lanai, and on studying these one is compelled to follow Hillebrand (loc. cit.) and J. F. Rock (*in herb.*) in regarding the Molokai and Lanai (and the above cited Maui) specimens as identical.

Labordia hirtella var. **β microphylla** Hillebr. Fl. Haw. Isls. 292. 1888.

Leaves numerous, mostly oblanceolate and rather narrowly so, tapering into a somewhat elongately acuminate apex, blade 3–6 cm. long and 1–2 (–2.5) cm. wide, densely fine-pubescent beneath. Corolla tube 6–9 mm. long. Capsule 2 cm. long, on more or less elongate (±3 cm.) pedicel, the 2 valves slightly but distinctly carinate at apex.

Type specimen: Collected by *William Hillebrand,* Kaanapali, West Maui, August, 1870 (Berl.).

Distribution: Known only from type locality in extreme-western West Maui.

Specimens examined: *Hillebrand,* Kaanapali, West Maui, August, 1870 (type, Berl., staminate and fruiting: staminate flowering branch from type, U. S.); *Hillebrand & Rev. J. M. Lydgate,* West Maui (Bish.; subflowering).

Labordia hirtella var. γ **sororia** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Leaves numerous, obovate or at times oval-oblong to ovate, at apex subabruptly or somewhat gradually acuminate, sparsely setulose beneath or glabrate except along the veins, mostly 2.5–5 cm. long and 1.3–2.6 cm. wide. Pedicels (at least above) and sepals glabrate. Corolla tube slender or thick (1.2–3 mm.), 8–10 mm. long. Anthers of sterile flowers cream-white, linear, about 2.2 mm. long. Pistillode spreading-pilose below with whitish hairs, its filiform stylar portion protruding in age 4–4.5 mm. past sepals and ending in a linear or narrowly obovoid stigmatic portion about 2.5 mm. long.

Type specimen: Collected by *Joseph F. Rock,* no 8,152, altitude of 4,000 feet, Honokowai Gulch, West Maui, August 24, 1910 (Bish.).

Distribution: Central and northwestern West Maui.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2,671 *pro parte,* Puu Kukui, July 26, 1938 (Goth.; staminate); *Charles N. Forbes* 103-*M,* Iao Valley, West Maui, June, 1910 (Berl.; Bish.; Field; Gray; Kew; Mo.; Par.; staminate); *Joseph F. Rock* 8,151, Hawaiian Isls. (Bish.; subfruiting); *Rock* 8,152 (type, Bish.: cotypes, Berl.; Field; Gray; Kew; Mus. V.; staminate); *Rock* 8,180, West Maui (Bish., 2 sheets; staminate).

Labordia hirtella var. δ **microcalyx** Hillebr. Fl. Haw. Isls. 292. 1888.

Leaves large, obovate to oblanceolate, subabruptly acuminate, more membranous, pale and subappressedly hispid underneath, blade 7–15 cm. long and 2.6–5.5 cm. wide, petiole mostly only 5–10 mm. long. Calyx glabrate, its lobes 3.5–5 mm. long, ovately dilated below (and narrowly linear above) middle; pedicel sparsely to moderately hispid. Corolla-tube slender, 1–1.2 cm. long. Pistillode white-hairy below, its filiform style protruding about 7 mm. above calyx; stigmatic portion narrowly oblong, about 2.2 mm. long.

Type specimen: Collected by *Rev. J. M. Lydgate*, in woods, Hilo, Hawaii, April, 1871 (Berl.).

Distribution: Known only from type locality in northeasternmost Hawaii.

Specimens examined: *William Hillebrand & Rev. J. M. Lydgate*, Hilo, Hawaii (Bish.; staminate); *Lydgate*, woods, Hilo, April, 1871 (type, Berl.: type fragment, U. S.; staminate).

Labordia hirtella var. ε **haleakalana** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Branchlets conspicuously corky-winged. Leaves oblong or obovate, abruptly short-acuminate, blade 5–15 cm. long and 2.5–6.5 cm. wide, minutely somewhat pubescent beneath, especially along veins; petiole glabrous or glabrate, 5–14 mm. long. Calyx as in var. *microcalyx* but pubescent. Corolla-tube slender, 12–14 mm. long. Pistillode's style extending ±9 mm. past the calyx, the stigmatic enlargement at apex linear-oblong and ±3.2 mm. long. Capsule glabrate, up to 3.7 cm. long.

Type specimen: Collected by *Joseph F. Rock*, no. 8,626, "Ukulele Waikamoi Haleakala," East Maui, October, 1910 (Bish.).

Distribution: Northeastern East Maui.

Specimens examined: *Otto Degener*, sine num., in extreme rain-forest, Koolau Gap, Haleakala Crater, June 17, 1927 (Field; fragment, subflowering); *Degener* 10,262, in rain-forest along Pipe-Line Trail, Olinda, July 30, 1927 (Field; staminate); *Degener* 10,265, same locality, June 21, 1927 (Berl.; Deg.; Field; flowering and post-fruiting); *Degener* 10,269, same locality, June 20, 1927 (Berl; Deg.; Field; fruiting); *Degener* 10,271, in dense rain-forest, same locality, June 16, 1927 (Berl.; Deg.; Field; staminate; teratological material, flowers closely aggregated in small clusters; leaves and calyx glabrous); *Degener* 10,302, same locality, June 17, 1927 (Berl.; Deg.; Field; subfruiting); *Charles N. Forbes* 160–*M*, in woods near Ukulele, above Olinda, July, 1910 (Bish.; Field; fruiting); *Forbes* 207–*M*, in woods above Olinda, July, 1910 (Bish., 2 sheets; staminate); *Forbes* 741–*M*, Ukulele, July, 1919 (Bish.; fruiting); *Forbes* 750–*M*, same locality and date (Bish.; subflowering); *Forbes* 925–*M*, same locality, July 25, 1919 (Bish.; subflowering); *Forbes* 1,153–*M*, north slope of Haleakala, August 15, 1919 (Bish.; subflowering); *Rock* 8,626 (type, Bish.: cotype, Gray; staminate).

Labordia hirtella var. ζ **hispidior** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Branchlets densely antrorse-hispid. Petioles more often very hispid, ±1 cm. long; blades ovate-oblong or scarcely oblong-subobovate, at apex acuminate, at base widely cuneate, on upper surface glabrous, on lower surface distinctly hispid with setae arcuate and (when dry) straw-colored, 6–8 cm. long and 2–3.5 cm. wide. Inflorescence loose, ±20-flowered. Calyx glabrous or glabrate, 7–8 mm. long. Pistillode's style hardly or slightly surpassing the sepals; its stigma slenderly cylindric, ±4 mm. long. Capsule not known.

Type specimen: Collected by *Charles Noyes Forbes*, no. 43–*M*, Hanakaoo, West Maui, May, 1910 (Bish.).

Distribution: Known only from type locality in westernmost West Maui.

Specimens examined: *Forbes* 43–*M* (type, Bish.; staminate); *Joseph F. Rock* 8,153 *pro parte*, Honokawai, August, 1910 (Bish.; subflowering).

Rock collected three specimens under his no. 8,153. One of them is cited here but a second (the third, while vegetatively matching the second, is sterile) is distinguished quickly by its larger and more strongly nerved sepals and must be referred to *L. Hedyosmifolia* var. *centralis*. It is interesting to note that Hillebrand (Fl. Haw. Isls. 292. 1888) experienced difficulty in separating *L. hirtella* at times from *L. Hedyosmifolia*. Thus he wrote: "In Lanai, where both it and the latter species [our *L. Hedyosmifolia* var. *centralis*] occur together, it is often difficult to assign a flowering specimen to one or the other on account of the variable length of the calycine lobes."

Labordia hirtella var. η **laevis** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Branchlets more or less curly-winged; leaves glabrate or finally very glabrous.

Type specimen: Collected by *Joseph F. Rock*, no. 16,012, Kamoku, Molokai, April, 1918 (Bish.).

Distribution: Known only from type locality on southern slope of eastern Molokai.

Specimens examined: *Rock* 16,012 (type, Bish.; staminate).

Labordia hirtella var. θ **imbricata** Degener & Sherff, var. nov.

Sepala plus minusve glabrata; demum ±1 cm. longa, graciliter 3- vel 5-nervata, diaphano-marginata, ovato-lanceolata, infra dilatata imbricataque.

Sepals more or less glabrate; when fully developed ±1 cm. long, delicately 3- or 5-nerved, diaphanous-margined, ovate-lanceolate, below the middle dilated and overlapping.

Type specimen: Collected by *Otto Degener*, no. 10,253, ravine *mauka* of road at elevation with considerable rainfall, along road 17 miles from Kohala toward Waimea, Hawaii, August 14, 1926 (Field).

Distribution: Known only from type locality in northwestern Hawaii.

Specimens examined: *Degener* 10,253 (type, Field: cotypes, Berl.; Deg.; subflowering and subfruiting).

The slender, elongate, immature capsules examined in the type collection are essentially glabrous and up to 2.9 cm long.

Labordia hirtella var. **laevisepala** Degener & Sherff, var. nov.

Inflorescentia ramulis pedicellisque brevioribus minus aperta vel expansa. Calyx glaber vel inferne interdum sparsim hispidulus, plerumque 4–6 mm. altus; sepalis supra subulatis infra lanceolatis vel saepius ovato-subdilatatis margine angusto-diaphanis. Corolla brevior, tubo 6–8 (rarius –12) mm. longo.

Inflorescence less open or expanded, because of the shorter branchlets and pedicels. Calyx smooth, or at times sparsely hispidulous below, commonly 4–6 mm. tall; sepals subulate above, lanceolate or more often ovate-subdilated below, narrowly diaphanous at the margin. Corolla shorter, its tube 6–8 (more rarely –12) mm. long.

Type specimen: Collected by *Otto Degener*, no. 10,280, growing about 6 feet tall, inflorescence drooping, corolla pale yellow, in rain-forest, at upper end of Hanalilolilo Pipe-Line, Molokai, April 24, 1928 (Field, 2 sheets).

Distribution: Known only from type locality in eastern Molokai.

Specimens examined: *Degener* 10,280 (type, 2 sheets, Field: cotypes, Berl.; Deg.; staminate).

17. **Labordia waialealae** Wawra, Flora 55: 516. 1872; op. cit. 58: 286. 1875.

Densely branched shrub about 1.2–1.8 meters tall; woody parts grayish-brown at least when dry, pubescent; branchlets divaricate, slender and mostly very nodose, the comparatively delicate internodes numerous and often only 3–7 mm. long. Leaves petiolate; blade oval to obovate, apically rounded and at times short-acuminate, basally more or less cuneate, thin, often drying with a bluish-gray to bluish-black color, in live state light green and on upper surface glistening, glabrous or on lower surface (especially on nerves) somewhat hispidulous, usually 1–2.5 cm. long but at times 5–7 cm. long and 3–4 cm. wide, often revolute; principal lateral nerves commonly 3 or 4 to a side; petiole slender or margined, up to 12 mm. long; stipules externally pubescent, internally glabrous and shining. Flowers mostly 3–20 in terminal cymes (occasionally solitary or clustered at tip of dwarf lateral branchlet and then perhaps seemingly axillary); fruiting pedicles blackish, pubescent below, about 6 mm. long; bractlets linear-filiform, 2–4 mm. long. Sepals linear-subulate, marginally more or less hyaline, glabrous or glabrate, obscurely nerved, 4–5 mm. long and mostly less than 1 mm. wide; corolla yellow, 8.5–10 (rarely –17) mm. long, glabrous or very remotely white-setulose outside, hispidulous within, the lobes irregularly 1–3.5 (–7) mm. long, tube 4.5–7.5 (–10) mm. long; anthers slightly exserted; pistillode extending about halfway up corolla-lobes, its sometimes slightly or very deeply cleft stigma slenderly cylindric and ±3 mm. long; pistil drying black or blackish, at anthesis pubescent and ±8 mm. long; ovary cylindric-fusiform, at first surpassed by calyx, 2-carpellate, soon glabrous or merely beset with a few white setae; style short (up to 2 mm.), equaling or exceeding the erect stigmata; capsule ovoid, smooth, dehiscent now from the apex downward now from the base upward, about 13 mm. or with persistent style about 15 mm. tall, the valves cristate-carinate at top; pulp copper-colored to orange-colored.

Type specimen: Collected by *Heinrich Wawra*, no. 2120, somewhat rare, in woods at the side of Waialeale toward the sea, Kauai, 1868–1871 (Mus. V.).

Distribution: Kauai, vicinity of Alakai Swamp; also in southeastern Molokai if we may rely upon the accuracy of the label for Faurie's plant.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2,827, Kilohana, north end of Alakai Swamp, August 13, 1938 (Goth.; post-fruiting); *Cranwell, Selling, & Skottsberg* (similarly) 2,827, trail to Lehuamakanoi, August 16, 1938 (Goth.; staminate); *Cranwell, Selling, & Skottsberg* 2,975, in forest near Kawaikoi Stream, near northwestern corner of Alakai.Swamp, August 16, 1938 (Goth.; fruiting; the dried pulp orange-colored, whence Wawra's description of the pulp, "aeruginea," is seen to mean copper-colored rather than, as given in the dictionaries, the color of copper-rust, that is, greenish); *Otto Degener* 10,249, small bush about 4 feet tall, not in wet situation, Waineke Swamp, Kokee, Kauai, June 28, 1926 (Deg.; Field, 2 sheets; staminate); *Degener* 10,250, same locality and date (Deg.; Field; staminate, pistillode about 13 mm. long, its slender style about 3 mm. long, stigma about 4.3 mm. long and 1 mm. thick, in one of the 3 flowers examined cleft almost to its base); *Abbé Urbain Faurie* 452, Kamalo (spelled Kamolo by Faurie), Molokai, June, 1910 (Bish.; sterile, but differing vegetatively in no way from Kauai specimens); *Charles N. Forbes* 331-*K*, Kaholuamanu behind Waimea, Kauai, September, 1909 (Berl.; Bish.; Field; Gray; Kew; Mo.; pistillate, flowering and subfruiting); *Forbes* 405-*K*, same locality and date (Bish.; Field; staminate and post-fruiting); *Forbes* 896-*K*, Alakai Swamp, Kauai, July 3-August 18, 1917 (Berl.; Field, 2 sheets; Gray; Kew; in vegetative state); *Forbes* 904-*K*, same locality and date (Bish.; staminate); *Forbes* 910-*K*, same locality and date (Berl.; Bish.; Field; subflowering); *Francis R. Fosberg* 12,756, shrub 1.5 meters tall, alt. 1,200 meters, wet forest, Alakai Swamp, near Lehuamakanoi, Kauai, January 3, 1936 (Field; staminate); *Albert S. Hitchcock* 15,459, alt. 3,600-5,080 feet, Waialeale, Kauai, October 22-24, 1916 (U. S.; staminate); *Joseph F. Rock* 4,873, woods of Kaholuamanu, Kauai, September, 1909 (Bish.; subflowering); *Rock* 5,250, Kaholuamanu, September, 1909 (Bish.; in vegetative state); *Rock* 5,251, Lehuamakanoi Ridge, Kauai, September 6, 1909 (Gray; subflowering); *Rock* 5,252, same locality (Bish.; staminate); *Rock* 5,892, trail to Lehuamakanoi, September 6, 1909 (Field; subflowering); *Rock* 5,894, trail to Kahana Valley, Kauai, September 10, 1909 (Bish.; staminate); *Rock* 5,898, Ridge of Lehuamakanoi, Kauai, September 6, 1909 (Bish.; staminate); *Rock* 5,899, Kaholuamanu Forest, Kauai, September 6, 1909 (Bish.; staminate); *Rock* 8,885, Waialeale, Kauai, October, 1911 (Bish., 2 sheets; Gray; in vegetative state); *Carl Skottsberg* 959, Alakai Swamp, Kauai, October 27, 1922 (Goth.; vegetative); *Harold St. John, Edward Y. Hosaka, Edward Hume, et al.* 10,734, Na Pali-Kona Forest Reserve, northwest end of Alakai Swamp, Kauai, December 27, 1930 (Bish.; N. Y.; fruiting); *Wawra* 2,120, somewhat rare, side of Waialeale toward the sea, Kauai, end of December, 1869, to May 1, 1870 (type fragment, Goth.; fruiting).

There is evident a high degree of habital, especially foliar polymorphism among the specimens included here under *L. waialealae*, in fact so much so that originally I attempted to differentiate the forms into two or more species or varieties, though without success. Recently (1938) Skottsberg restudied the plants in their native habitat and concluded at least provisionally that there were two distinct forms. On receipt of word from him to this effect, I reconsidered my above treatment but was again unable to accomplish a segregation. Under date of March 22, 1939, Dr. Skottsberg writes: "As regards the two forms of *Labordia waialealae*, which you find it impossible to distinguish, they are so unlike each other when alive that they cannot be confused, but I suppose the flowers are identical." One can only hope that the matter of species delimitation here will be investigated by future field workers, who certainly should give serious consideration to the possibilities of hybridization and to the effect of unlike growth conditions.

18. **Labordia Lydgatei** C. N. Forbes, Occas. Paps. Bish. Mus. 6: 176 and plate. 1916.

Shrub or small tree, branchlets pubescent and angulate. Leaves more or less cuneately narrowed below into a very short (2–4 mm.) or long (5–15 mm.) sparsely hispidulous petiole; blade elliptical or broadly oblanceolate to narrowly obovate, acuminate at apex, glabrous above, moderately appressed-hispidulous beneath, 5–10 cm. long and 2–3 cm. wide. Cyme open, delicate, irregularly pilose, 6–21-flowered, branches and ultimate pedicels capillary. Calyx glabrous, about 2 mm. tall, parted to near base into basally triangular-ovate upwardly linear-subulate sepals. Corolla glabrous externally, pilose internally, pale yellow, its slender tube 4–5 mm. long; lobes linear-subulate, 2–3 mm. long. Capsule globose, smooth, not winged, 2-valved, 4 mm. thick.

Type specimen: Collected by *Charles N. Forbes*, no. 179–*K*, on ridges near the swamp, Wahiawa Drainage Basin, Kauai, August, 1909 (Bish.). Forbes cited Lydgate's specimen before his own, and had to rely upon the Lydgate plant for the fruiting characters. His illustrative plate was taken from his own no. 179–*K*, however, and his citation of "ridges near the swamp" for the type locality, shows that he had in mind as his type this same collection number (Lydgate gave merely "Wahiawa Mts." for the locality).

Distribution: Known only from type locality in southernmost Kauai.

Specimens examined: *Forbes* 179–*K* (cotype, Field; staminate); *Forbes* 204–*K*, Wahiawa Mts., August, 1909 (Field; Mo.; staminate); *Rev. J. M. Lydgate*, same locality (Bish.; staminate).

My description of the capsule is taken entirely from Forbes' original text, based upon a fruiting specimen collected by Lydgate, not seen by me. Forbes remarks upon the small size of the capsule, stating that it is smaller than that of any other species of *Labordia* known to him. It may be added that the minute calyx and corolla, also the capillary branches of the delicate cyme, are additional diagnostic characters of value. The leaves apparently tend to dry blackish on their upper surface.

19. **Labordia Helleri** Sherff, Amer. Journ. Bot. 25: 581. 1938; *Labordia Tinifolia* var. γ Hillebr. Fl. Haw. Isls. 293. 1888 (as to description and first cited material, a specimen from Kauai, found to be *Knudsen* 199 in the Hillebrand herbarium at Berlin).

Capsules about 1.2–1.3 cm. long............*L. Helleri sensu stricto.*
Capsules 1.5–2.4 cm. long.......................var. *β macrocarpa.*

Shrub or medium-sized tree, glabrous; branches more or less grayish, terete, scarcely divaricate. Leaves upwardly somewhat close together, petiolate with petioles slender and 7–15 mm. long; blades membranaceous, elliptic-oblong or obovate-oblong, pallid, at apex shortly acuminate, at base cuneately contracted, at margin entire or very obsoletely denticulate, smooth, 4.5–10.5 cm. long and 1.7–4 cm. wide; principal lateral nerves subobsolete, very delicate, commonly 5–7 to a single side. Flowers paniculate-cymosely disposed, ±25 in an inflorescence; branches of inflorescence opposite, delicate, glabrous, divaricate; peduncle 0.5–2 cm. long, pedicels finally ±1 cm. long. Calyx glabrous, about 2 mm. tall; lobes ovate-cordate, at apex acute, at margin conspicuously straw-yellow, at base more or less auriculate, at least 1 mm. long. Corolla thickish-cylindric; tube externally glabrous, internally white-pilose, 6–8 mm. long and up to 2.5 or at the throat to 3 mm. thick, sometimes upwardly narrowed; lobes cordate-ovate, spreading, acute, marginally straw-colored when dry, about 1.7 mm. long; anthers slightly exserted; pistillode's head exserted for half its length. Pistillate flowers unknown at anthesis. Capsules ovoid, at apex conspicuously and very sharply mucronate, about 12–13 mm. long, bivalved; valves longitudinally and reticulately veined on outer surface.

Type specimen: Collected by *Amos Arthur Heller*, no. 2,579, on the ridge west of the Hanapepe River, Kauai, July 17, 1895 (Field).

Distribution: Haupu Range to west of the Hanapepe River, southeastern Kauai.

Specimens examined: *Heller* 2,579 (type, Field: cotypes, Berl.; Bish.; Corn.; Gray; Kew; Minn.; N. Y.; Par.; Petrop.; fruiting at Gray and N. Y., elsewhere staminate); *Heller* (similarly) 2,579, ridge west of Hanapepe River, August 22, 1895 (Mo., 1 sheet of staminate and 1 sheet of fruiting material; N. Y., staminate; U. S., staminate and fruiting on same sheet); *Valdemar Knudsen* 199, Kauai (herb. Hillebrand in Berl.; fruiting); *St. John, Hosaka, Hume, et alii* 10,990, tree 20 feet tall, alt. 800 feet, Napali Coast, Hanakapiai, January 2, 1931 (Berl.; Bish.; Field; fruiting); *St. John, Fosberg, Oliveira* 13,810, slender shrub 8 feet tall, flowers white, pendulous, hairy inside, alt. 3,600 feet, Kumuwela Ridge, Waimea, December 28, 1933 (Berl.; Bish.; Field; Par.; staminate).

Easily distinguishable from *L. Tinifolia*, with which it has heretofore been confused, by the shape and yellowish margins of its calyx-lobes and by the acutely ovoid fruits, these being (under a lens) conspicuously and reticulately lengthwise-veined. The existence of a variety (*macrocarpa*) with comparatively gigantic fruits but with the same peculiarities of shape and external venation to the fruits lends additional support (if such be needed) to the segregation of this form as a distinct species.

Hillebrand (loc. cit.) described his *L. Tinifolia* var. γ in the few words: "Capsules ovoid, acute, 6‴ long." He cited "Kauai! Maui! *Kaanapali;* Lanai! leaves small obtuse, almost rounded at the base; Hawaii!" for the distribution.[1] The Lanai material, as also that from Hawaii and West Maui, has been separated by me as *L. Tinifolia* var. *lanaiensis.*

The material from the first cited locality, i.e., Kauai, is still extant in Hillebrand's herbarium (Berl.). It was collected by Knudsen, no. 199, and matches Heller's specimens closely. Heller (Minn. Bot. Studs. 1: 877. 1897) stated that his specimens were obtained "from a medium-sized tree" in July.

Labordia Helleri var. β **macrocarpa** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Shrub or small tree ±4.5 meters tall. Capsules acute, oblongly or lanceolately ovoid, more often 1.5–2.4 cm. long.

Type specimen: Collected by *Amos Arthur Heller*, no. 2,868, on Kaholuamanu above Waimea, Kauai, October 1–8, 1895 (U. S.).

Distribution: Kauai.

Specimens examined: *Charles N. Forbes* 378–*K*, Kaholuamanu, behind Waimea, September, 1909 (Bish.; Field; Kew;, flowering and fruiting); *Forbes* 721–*K*, Haupu Range, left-hand side of Kipu Kai Gap, November 1, 1916 (Field; Mo.; fruiting); *Forbes* 962–*K*, Waimea Drainage Basin, west side, July 3–August 18, 1917 (Bish.; Field; Par.; fruiting); *Forbes* 1,133–*K*, same locality and date (Bish.; fruiting); *Heller* 2,868 (type, U. S.: cotypes, Field; Gray; Mo.; N. Y.; fruiting); *William Hillebrand*, Hawaiian Isls. (U. S.; fruiting); *Joseph F. Rock* 5,887, trail to Opaewela, Kaholuamanu, September, 1909 (Bish.); *Rock* 5,888, Kaholuamanu, September 7, 1909 (Bish.; Gray; Mus. V.; fruiting); *Rock* 5,890, trail to Opaewela, Kaholuamanu, September, 1909 (Bish.); *Rock* 5,891, same locality and date (Bish.); *Rock* 5,912, growing as a shrub, trail to Opaewela Stream near Kaholuamanu, September 7, 1909 (Bish.); *Rock* 17,103, Kaholuamanu, October, 1916 (Bish., 3 sheets; fruiting).

---

[1] His Lanai material itself (Berl.) enables us to recast the ambiguous and misleading description of its leaves to read: *leaves small, their base obtuse or almost rounded.*—They are not obtuse at the apex.

Heller (Minn. Bot. Studs. 1: 876. 1897) doubtfully referred his no. 2,868, which constitutes the basis of var. *macrocarpa*, to *Labordia pallida*, with which it has very little in common. His specimens were collected "from a small tree, about fifteen feet high, with slender trunk, and spreading top." His printed labels all give October 1–8 as the date of collection, but his published discussion (loc. cit.) gives the date as September 25.

20. **Labordia triflora** Hillebr. Fl. Haw. Isls. 293. 1888.

Glabrous shrub or small tree with habit as in *L. Tinifolia*. Leaves subsessile to shortly petiolate with petioles mostly 1–2 mm. long; blades commonly ovate- sometimes obovate-oblong, cordate or emarginate at the rounded or truncate base, acuminate at apex, thin, 7–8.5 cm. long and 2.5–4 cm. wide, principal lateral nerves about 7 to each side. Cyme commonly 3-flowered, with delicate often cernuous peduncle of 3–5 cm. in length; pedicels subequal, 1.2–3 cm. long, minutely bracteolate at or near their middle, the median one sometimes branching to bear 2 or 3 flowers. Calyx and corolla as in *L. Tinifolia*, but the corolla's tube 10–12 mm. long. Capsule more or less elongately conic-ovate, apically pointed with a rostrum about 1 mm. long, 0.9–2 cm. tall, 2-valved, drying a blackish-brown at maturity.

Type specimen: Collected by *William Hillebrand*, Mopulehu (Mapulehu), Molokai, July, 1870 (Berl.).

Distribution: Known only from type locality in southeasternmost Molokai.

Specimens examined: *Hillebrand*, Molokai (Berl.; Gray; U. S.; fruiting); *Hillebrand*, Mapulehu, July, 1870 (type, Berl.; fruiting).

Hillebrand describes the capsules as 1.4–2 cm. (7–10 lines) long, but two sheets examined (Berl.; U. S.) have some mature capsules less than 1 cm. long, offering an approach somewhat to the capsules of *L. Tinifolia.* However, the fewer flowers or fruits, the cordate bases of the leaves, and the elongate peduncle all afford a ready distinction from *L. Tinifolia* and its varieties.—Staminate specimens are lacking in herbaria.

21. **Labordia Tinifolia** A. Gray, Proc. Amer. Acad. 4: 322. 1860.

a. Principal leaves mostly obtuse to subacute at apex, not acuminate.
  b. Leaf-petioles 1–1.8 cm. long, their length usually more than half the blades' width; plant native of northwestern Oahu. var. δ *waialuana.*
  b. Leaf-petioles mostly 4–10 mm. long, their length usually less than half the blades' width.
    c. Leaves numerous, appearing crowded toward tips of branchlets, mostly obovate, plant native of East Maui. var. ζ *Euphorbioidea.*
    c. Leaves fewer and not crowded, oblong or broadly oblong-oval or a few somewhat obovate; plant native of Lanai. var. ε *lanaiensis.*
a. Principal leaves mostly acute to acuminate at apex.
  b. Blades of principal leaves 2.5–4 cm. long, at apex sharply acuminate; plant native of northern Molokai. var. β *parvifolia.*
  b. Blades of principal leaves 4–18 cm. long.
    c. Leaves mostly lanceolate or elliptic-oblanceolate.
      d. Leaf-blades mostly under 5 cm. long; plant of southeastern Oahu .... var. κ *honolulensis.*
      d. Leaf-blades mostly over 5 cm. long; plants of Molokai.
        e. Leaves attenuate-acuminate at apex, flowering cymes paniculate; plant of eastern Molokai. .var. η *Forbesii.*
        e. Leaves barely acuminate at apex, flowering cymes subcorymbose; plant of central Molokai. var. ι *tenuifolia*
        e. Leaves barely acute at apex, flowering cymes paniculate; plant of Kauai .... var, θ *microgyna.*
    c. Leaves mostly broader, at apex acute or moderately acuminate.

d. Corolla-tube at anthesis commonly dilated toward base; capsules usually more ovoid-globose or obovoid-globose, ripening commonly a dull or grayish black, mostly 6–9 mm. long .... *L. Tinifolia sensu stricto.*

d. Corolla-tube slender below; capsules usually very globose and ripening very black, 4–6 mm. long. var. γ *leptantha*.

A small tree 6–8 (or even 15) meters tall, glabrous; bark "dark brown," "closely and deeply corrugated, the furrows . . . not straight but" seeming "to encircle the trunk, somewhat cork-screw fashion" (Rock); branches slender, terete, pale; branchlets usually terete or subterete. Leaves petiolate, petiole slender or margined above with the somewhat decurrent blade, 4–15 mm. long; blade elliptic-oblong to obovate-oblong, acute or acuminate at both ends, thin, very glabrous, often slightly repand, 5.5–11 cm. long and 1.8–4.8 cm. wide. Interpetiolar stipular body thin, concave or convex or of uniform height on upper edge, glabrous or occasionally pubescent externally, commonly setulose at top. Flowers many in a paniculate cyme 3.5–10 cm. long, this with a peduncle 1–3.5 cm. long, its primary branches opposite and rather distant, the ultimate pedicels 6–18 mm. long, the subulate bractlets about 2 mm. long. Calyx 2.5–3 mm. long, divided to nearly or about the middle into 5 triangular-subulate lobes, these spreading or reflexed in fruit, not or at most obscurely scarious-margined; corolla greenish, salver-shaped; its tube dilated below (where often 2–2.5 mm. thick at anthesis), glabrous or sparsely hispidulous outside, pubescent within, 6–8 (in West and East Maui specimens at times only 3.5–5) mm. long, the triangular-ovate lobes about one-third as long. Pistil at anthesis 5–8 mm. long, shorter than or at times somewhat surpassing corolla-tube, resembling pistillode of other species; stigma entire or slightly cleft at apex, cylindric-clavate, minutely setulose in lengthwise lines, about 2 mm. long, often passing imperceptibly (except as to pubescence) into glabrate and frequently bent or twisted style (this 1–3 mm. long); ovary narrowly conic to ovoid, nearly or quite glabrous (but often irregularly pilose over small areas), ±2 mm. long. Pistillode usually pubescent (at anthesis) ±8 mm. long and usually somewhat exserted; ovary linear, hispid near base, ±2.5 mm. long; style nematoid, more or less glabrous, 2–4 mm. long; stigma obconic-clavate, ±3 mm. long. Capsule globose or ovoid-globose or somewhat obovoid-globose, obtuse-rotund at top except for tiny stylar rostrum, 5-9 mm. tall, commonly 2- very rarely 3-valved, the valves dorsally rounded and with median nerve faint or obsolete.

Type specimen: Gray's original text gives, "Sandwich Islands, in Kauai, Maui, Oahu, and Hawaii (coll. Expl. Exped., and coll. Remy)." Gray's description of the fruit, "capsula globosa," enables us at once to exclude Kauai material, which may now be referred to *L. Helleri* or its variety *macrocarpa* (Gray apparently had not seen fruiting material from Kauai). The Maui citation is represented by *Jules Remy* 360,[1] consisting of two specimens of abundantly flowering material, labeled in Gray's own handwriting (Herb. Gray). This is closely matched by a fruiting specimen on the same sheet and likewise under Remy's no. 360, from the Island of Hawaii. All three specimens have rather definitely peduncled inflorescences, the peduncles being about 1 cm. long. A sheet of identical fruiting material collected by the United States Exploring Expedition (Herb. U. S.) and likewise labeled in Gray's own handwriting, gives merely "Sandwich Islands" for the locality. Hence *Remy* 360, from Maui and Hawaii, 1851–1855 (Gray) may well be taken as the type.

Distribution: Hawaii, Maui, Molokai, and Oahu.

Specimens examined: *L. W. Bryan*, alt. 2,500 feet, land of Manuka, Kau District, Hawaii, February, 1933 (Deg.; Field; a form with branchlets more angular); *Otto Degener* 9,841, in forest, Kohala Forest Reserve, Hawaii, August 8, 1926 (Deg.; Field; fruiting); *Degener* 10,300, in forest, "2nd valley," Molokai, June 19, 1928 (Deg.; Field; staminate, subflowering material, somewhat atypic); *Degener, Salucop, & Arlantico* 12,019, erect tree 15 feet tall with horizontal branches, in forest, Pupukea-Kahuku area, Oahu, April 24, 1938 (Berl.; Deg.; Field, 2 sheets; fruiting); *Degener, Shigeura, & Topping* 10,065, in woods, Manoa Cliff Trail, Oahu, November 20, 1935 (Berl.; Deg.; Field; fruiting); *Abbé Urbain Faurie* 537, Waianae, Oahu, May, 1909 (Par.; fruiting); *Charles N. Forbes* 1,602-*O*, east side of Nuuanu Valley, Oahu, October, 1910 (Field; Mo.; fruiting); *Forbes* 1,844-*O*, Waiolani Ridge, Oahu, October 27, 1913 (Bish.; fruiting); *Forbes* (with *Mr. Labouchere*) 2,293-*O*, Kalihi Pali, Oahu, February 16, 1916 (Bish.; post-fruiting); *Forbes* 2,327-*M*, central ridge of Olowalu Valley, West Maui, May 12, 1920 (Bish.; staminate); *Francis R. Fosberg* 13,002 *pro parte*, shrub 2–3 meters tall, alt. 860 meters, on moist wooded ridge, east ridge of Puu Kalena,

---

[1] A small additional specimen, *Remy* 361*bis*, is in Gray Herbarium and this was labeled "*Labordia tinifolia*, n. sp." by Gray himself. This specimen is now seen, however, to be varietally different and referable to var *Euphorbioidea*.

Waianae Mts., Waianaeuka, Oahu, March 22, 1936 (Field; fruiting); *F. R. & V. O. Fosberg* 13,737, tree 2 meters tall, flowers greenish, in wet forest, alt. 650 meters, Castle Trail, Punaluu Valley, Koolau Mts., Oahu, April 25, 1937 (Bish.; Field; pistillate); *Fosberg & Fosberg* 14,195, bush 2 meters tall, in moist forest, alt. 430 meters, Mt. Tantalus, Koolau Mts., July 5, 1937 (Bish.; Field; fruiting); *Fosberg & E. Y. Hosaka* 14,001, tree 6 meters tall, alt. 460 meters, in moist forest, Pupukea-Kahuku Trail, Hanakaoe, crest of Koolau Mts., May 31, 1937 (Field; fruiting); *William Hillebrand,* Makawao beyond Pumelei, East Maui, July, 1858 (Berl.; staminate); *Hillebrand,* valley on Oahu, September, 1860 (Berl.; fruiting); *Hillebrand,* Gulch of Olualu (Olowalu), West Maui, August, 1870 (Berl.; fruiting); *Hillebrand* 404, Nuuanu, Oahu, communic. in 1865 (Gray; Kew; pistillate, both flowering and fruiting); *Hillebrand & Rev. J. M. Lydgate,* Pauoa, Oahu (Bish.; pistillate, both flowering and fruiting); *Hillebrand & Lydgate* 95, Halona, West Maui (Bish.; pistillate, some corolla tubes only 3.5 mm. long and basally much thickened); *Horace Mann & William T. Brigham* 610 *pro parte,* Oahu (Gray; fruiting); *Mann & Brigham* 738 (renumbered 610), without locality (Bish.; fruiting); *Jules Remy* 320, Oahu, 1851–1855 (Par.; pistillate); *Remy* 360, Maui (as to staminate, flowering specimens) and Hawaii (as to fruiting specimens), 1851–1855 (Gray, flowering and fruiting; Par., fruiting); *Remy* 361, mountains, Oahu, April, 1855 (Gray; Par.; subflowering); *Joseph F. Rock,* Haleakala, East Maui (Mus. V.; pistillate); *Rock,* Kailua ditch trail, Waikamoi, East Maui, May, 1911 (Gray; pistillate); *Rock,* Honomanu Trail, EastMaui, May, 1911 (Bish.; Field; staminate); *Rock* 14,062, without locality or date (Bish.; Field; staminate); *United States Exploring Expedition under Captain Wilkes,* Hawaiian Isls., 1840 (N.Y., pistillate; U.S., fruiting).

The Rock material from East Maui has especially short, urceolate corollas and was considered a new species by its collector. Its corollas are matched in size and shape fairly well by some on the Hillebrand & Lydgate specimen from Halona, West Maui. In the absence of fruiting characters, however, there seems no reason for regarding either collection as representing more than merely a somewhat smaller-flowered extreme of *L. Tinifolia.*

Labordia Tinifolia var. β parvifolia Sherff, Amer. Journ. Bot. 25: 583. 1938; *Labordia Tinifolia* var. β Hillebr. Fl. Haw. Isls. 293. 1888.

Leaves smaller, petioles 4–10 mm. long; blades commonly oblong-elliptic, at both ends acuminate, 2.5–4 cm. long and 1–1.6 cm. wide, principal lateral nerves 3–5 to each side. Cymes few-flowered, peduncle slender and ±2 cm. long, pedicels capilliform and 2–2.5 cm. long; capsules blackish or gray, 6–8 mm. tall.

Type specimen: Collected by *William Hillebrand*, Kalaupapa Pali, central northern coast of Molokai (Berl.).

Distribution: Known only from type locality on Molokai.

Specimens examined: *Hillebrand*, Kalaupapa (type, Berl.; fruiting).

Numerous specimens referred in herbaria to Hillebrand's var. β by various workers on the Hawaiian flora are found to differ sharply from Hillebrand's type, mostly in shape and size of leaves, and in shape, size, and abundance of capsules. The type consists of three small fruiting specimens; flowers are entirely lacking.

Labordia Tinifolia var. γ **leptantha** Sherff, Amer. Journ. Bot. 25: 582. 1938.

Small tree or shrub similar in habit to species proper; branchlets slender, terete, gray. Leaves very glabrous, petiolate with petioles slender and 0.5–1.5 cm. long; blades elliptic-oblong or scarcely elliptic-obovate, at apex acute or acuminate, at base acute or cuneate or rarely subrotund, at margin entire or obscurely subdenticulate, membranaceous, 4–8.5 cm. long and 1.7–3.2 cm. wide, principal lateral nerves 5–8 to each side. Interpetiolar stipular body ovate-triangulate, pubescent above, 1–1.5 mm. tall. Inflorescence cymose-paniculate, subsessile (for staminate specimens) or manifestly pedunculate (for pistillate specimens); the ultimate pedicels glabrate, at first very slender, 7–15 mm. long. Bractlets subulate, 1–2 mm. long. Calyx about 2 mm. tall; lobes connate below middle, triangulate-subulate, glabrous or at margin very minutely hispidulous-ciliate; corolla narrowly cylindric, externally glabrate, internally erect-setose, tube 8–9 mm. long and less than 2 mm. thick, lobes triangulate-lanceolate, spreading or at apex reflexed, about 3 mm. long; anthers very slightly exserted; pistillode pubescent at top, clavate-dilated, finally exserted for about 1 mm. Capsule globose or subobovate-globose, finally black, 4–6 mm. long; valves 2, dorsally rounded, at apex minutely mucronate.

Type specimen: Collected by *Joseph F. Rock*, no. 14,062, Kalae, Molokai, May 25, 1918 (Bish., 2 sheets).

Distribution: Southeastern Oahu, West Maui, and north-central Molokai.

Specimens examined: *Anonymous* (*Otto Degener* distrib. no.) 10,241, trail at Nuuanu Pali "hairpin turn," Oahu, November 20, 1926 (Deg.; Field; fruiting); *Degener* 10,255, exposed slope, northeast of Nuuanu Pali, Oahu, November 20, 1926 (Berl.; Deg.; Field; fruiting); *Degener* 10,260, in forest, half mile north of Keahikauo, West Maui, July 21, 1927 (Berl.; Deg.; Field; fruiting); *Charles N. Forbes* 1,602-*O*, east side of Nuuanu Valley, Oahu, October, 1910 (Berl.; Bish.; Field; Gray; Kew; fruiting); *Forbes* 2,306-*M*, ridge, left-hand side, Olowalu Valley, southwestern West Maui, May 10, 1920 (Berl.; Bish.; Field; staminate); *William Hillebrand*, Wailupe, Oahu (Berl.; U. S.; fruiting); *Hillebrand*, same locality, 1870 (Berl.; staminate); *Rock* 14,062 (type, Bish., 2 sheets; staminate, abundantly flowering); *communic. Heinrich Wawra sub num.* 2,283 (*legit William Hillebrand*), Oahu (Mus. V.; fruiting).

The fruiting characters are drawn from Oahu material (*Degener* distrib. no. 10,241; *Forbes* 1,602-*O;* Hillebrand, Mus. V.). All pistillate or fruiting specimens examined differed from the staminate in having definitely pedunculate inflorescence. Further studies should be made in the field to confirm the varietal identity of the two sets of specimens listed here. (It might even be that some botanists will prefer a separate specific status for var. *leptantha*. The description therefore has been presented as fully as herbarium material available would seem to warrant.)

Labordia Tinifolia var. **δ waialuana** Sherff, Amer. Journ. Bot. 25: 583. 1938.

Petioles 1–1.8 cm. long; blades subrhomboidally elliptic-oblong, at base cuneate or subacuminate, at apex subobtuse and very shortly or obsoletely mucronate, 6–8.5 cm. long and 1.7–3.2 cm. wide, principal lateral nerves 5–7 to each side. Inflorescence at least 3- or 9-flowered, slenderly pedunculate with a peduncle 2–3 cm. long. Staminate flowers (pistillate not seen) pedicellate, pedicels up to 1.5 cm. long; corolla 2.5 mm. thick toward base, tube urceolate-cylindric and 7–8 mm. long, lobes ±3 mm. long; anthers not or but slightly exserted.

Type specimen: Collected by *Horace Mann* and *William T. Brigham*, no. 562, Waialua Mountains, Oahu (Gray).

Distribution: Northwestern Oahu.

Specimens examined: *Mann & Brigham* 562 (type, Gray: cotypes, Corn.; Field; N. Y.; both staminate and fruiting).

The type number is represented in the New York Botanical Garden by additional but very fragmentary specimens of fruiting material, on the same sheet with staminate, flowering material. The capsules are as in the var. *leptantha*. The sheet at Cornell University has two sprays, each with two triflorous inflorescences. Mann had designated these specimens at Cornell as a variety of *L. Tinifolia* and chosen a varietal name alluding to the triflorous habit. In his printed Enumeration published later on (Proc. Amer. Acad. 7: 197. 1867), however, he listed the collection as *L. Tinifolia*.

Labordia Tinifolia var. ε **lanaiensis** Sherff, Amer. Journ. Bot. 25: 583. 1938; *Labordia Tinifolia* var. γ Hillebr. Fl. Haw. Isls. 293. 1888 (excluding the Kauai or first cited material).

Petioles 4–14 mm. long; blades oblong or widely oblong-oval or more rarely subobovate, at apex obtuse or subacute or even subacuminate, at base widely cuneate or rarely almost subrotund, commonly 4–8 (sometimes up to 9.5) cm. long and 2–4 (sometimes up to 5.2) cm. wide. Inflorescence very slenderly pedunculate with a peduncle up to 3.5 cm. long, few- (±9–12-) flowered, pedicels delicate. Corolla (only staminate flowers known) not or but slightly dilated below, about 7 mm. long, lobes ±2 mm. long; pistillode slightly exserted. Capsules narrowly or oblongly ovoid in outline, at apex sharply mucronate, 1.3–1.7 cm. long.

Type specimen: Collected by *William Hillebrand*, Lanai, July, 1870 (Berl.).

Distribution: Hawaii, eastern Lanai, and western Maui.

Specimens examined: *Charles N. Forbes*, Lanai, March 9, 1916 (Field); *Forbes* 4–*L*, Kaiholena Valley, Lanai, June, 1913 (Field; fruiting); *Forbes* 79–*L*, mountains near Koele, Lanai, June 9, 1909 (Bish.; Field; Kew; Mo.; subfruiting); *Forbes* 267–*L*, mountains at east end of Lanai, June, 1913 (Bish.; Field; Gray; subfruiting); *Forbes* 281–*L*, same locality and date (Berl.; Bish.; Field; Kew; Mo.; subflowering and fruiting); *William Hillebrand*, Kaanapali, West Maui (Berl.; subflowering and fruiting; labeled by Hillebrand for his var. γ); *Hillebrand*, Hawaii, 1868 (Berl.; fruiting); *Hillebrand*, Lanai, July, 1870 (type, Berl.; staminate); *George C. Munro* 35, "Waiopaa," Lanai, March 27, 1915 (Bish.; staminate); *Munro* (similarly) 35, Kaohai, Lanai, July 2, 1914 (Bish.; fruiting); *Munro* 430, pali above "Waiopaa," Lanai, March 27, 1915 (Bish.; Field; staminate); *Munro* 432, head of Maunalei by Mahana, Lanai, March 27, 1915 (Bish.; Field; subfruiting); *Joseph F. Rock* 8,000, alt. 2,000 feet, dry forehills, Mahana Valley, Lanai, August 1, 1910 (Bish., 2 sheets; Field; Gray; Kew; Mus. V.; fruiting); *Rock* 8,099, damp forest, Mahana Valley, August 6, 1910 (Bish.; Gray; Mus. V.; fruiting); *Rock* 8,169, West Maui, August, 1910 (Bish.; fruiting).

The type has small leaves, the blade commonly 3–5 cm. long and up to 2.4 cm. wide. The larger measurements in the description, as also the characters of the capsule, are taken from other cited specimens, which do not appear to be varietally different.

Labordia Tinifolia var. ζ **Euphorbioidea** Sherff, Amer. Journn. Bot. 25: 583. 1938.

Leaves smaller and more numerous, petioles commonly 4–7 mm. long; blades more or less obovate, 2–4 more rarely up to 5.3 cm. long and 1.2–1.7 more rarely up to 2.5 cm. wide, at apex more often obtuse or rotund. Inflorescence few- or subnumerously flowered; peduncle ±5–10 mm. long, standing between 2 branches. Capsule as in species proper.

Type specimen: Collected by *Joseph F. Rock*, no. 8,616, alt. 2,500 feet, in lower forest, Makawao, East Maui, October, 1910 (Bish.).

Distribution: East Maui.

Specimens examined: *H. M. Curran* 66, Maui, April, 1911 (U. S.; sterile); *Abbé Urbain Faurie* 536, Haleakala, August, 1909 (Bish.; fruiting); *Jules Remy* 361*bis*, Maui, 1851–1855 (Gray; subfruiting); *Rock* 8,616 (type, Bish.: cotypes, Gray; Mus. V.; fruiting).

The small, mostly obovate, often crowded leaves give specimens of this variety a striking resemblance to those of several varieties of *Euphorbia Celastroides* and of *E. multiformis*. Rock (Indig. Trees Haw. Isls. 406. 1913) describes the trunks of the trees in the forests above Makawao as straight.

Labordia Tinifolia var. η **Forbesii** Sherff, Amer. Journ. Bot. 25: 583. 1938.

Leaves abundant, pallid, the delicate petiole usually 1–2 cm. long; blade variously lanceolate subrhombic-lanceolate or elliptic-oblanceolate but seldom broader, at apex more attenuately acuminate than in species proper, 5–8 cm. long and 1–3 cm. wide. Pistil minute, about 4 mm. long, style more or less twisted near stigma. Capsule globose-obovate, 5–8.5 mm. long.

Type specimen: Collected by *Charles N. Forbes*, no. 553–*Mo*, on slopes of Olokui, Wailau, Molokai, September, 1912 (Bish.).

Distribution: Known only from type locality in northeastern Molokai.

Specimens examined: *Forbes* 553–*Mo* (type, Bish.: cotypes, Berl.; Bish.; Field; Gray; Kew; Mo.; pistillate and post-fruiting).

Labordia Tinifolia var. θ **microgyna** Deg. & Sherff, var. nov.

Folia oblonge vel elliptice lanceolata, petiolo angusto ±1 cm. longo, lamina saepius 5–7.5 cm. longa et 2–3 cm. lata. Inflorescentia paniculata, ±17-flora. Calyx circ. 2 mm. altus. Corolla ±8 mm. alta, tubo ±2 mm. crasso. Pistillum ad anthesin tantum circ. 4 mm. longum, rectum; ovario ovoideo et vix 1.5 mm. longo; stylo sursum in stigma breve et parce dilatatum sensim attenuato. Capsula et planta masculina ignotae.

Leaves oblong- or elliptic-lanceolate; petiole slender, ±1 cm. long; blade more often 5–7.5 cm. long and 2–3 cm. wide. Inflorescence paniculate, ±17-flowered. Calyx about 2 mm. tall. Corolla ±8 mm. tall, tube ±2 mm. thick. Pistil at anthesis only about 4 mm. long, straight; ovary ovoid and scarcely 1.5 mm. long; style gradually narrowed above into a short and scarcely dilated stigma. Capsule and staminate plant unknown.

Type specimen: Collected by *Otto Degener*, no. 10,251, in rainforest, northeast of Kipu, Kauai, June 17, 1926 (Field).

Distribution: Southeasternmost Kauai.

Specimens examined: *Degener* 10,251 (type, Field; cotypes, Berl.; Deg.; pistillate).

The foliar habit seems entirely that of *L. Tinifolia* proper, but the diminutive, straight pistils with their thickish and not distinctly differentiated style and their short, inconspicuous stigma are somewhat anomalous. Staminate flowers and mature capsules are much to be desired. If *L. microgyna* is to be retained as a variety of *L. Tinifolia*, it is probably best placed next to var. *Forbesii*. In the latter variety, the pistil is likewise minute, but is distinctly differentiated into ovary, style, and stigma.

Labordia Tinifolia var. ι **tenuifolia** Degener & Sherff *ex* Sherff, Amer. Journ. Bot. 25: 583. 1938.

Erect, slender tree. Leaves pallid, the slender petiole 0.5–1.5 cm. long; blade lanceolate or elliptic-oblanceolate or oblong-subovate, at apex scarcely or moderately acuminate, commonly 4–6.5 (more rarely –9) cm. long and 1.5–2.2 (more rarely –3.3) cm. wide. Flowers numerous (more often 15–30), subcorymbosely disposed in a pendulous inflorescence. Corolla yellow and not truly orange; tube slender, about 7 mm. long and toward base 1.3–1.7 mm. thick; lobes 3–3.5 mm. long; pistillode with a black and glabrate style.

Type specimen: Collected by *Otto Degener*, no. 10,272, erect,

slender tree 12 feet tall, in forest, Kahuaawi Gulch, Molokai, May 12, 1928 (Field, 2 sheets).

Distribution: Known only from type locality in central Molokai.

Specimens examined: *Otto Degener*, Molokai, May 25, 1928 (Berl.; Deg.; Field; Gray; Kew; Mo.; Mus. V.; Par.; U. S.; staminate); *Degener* 10,272 (type, Field, 2 sheets: cotypes, Berl.; Brit.; Del.; Gray; Kew; Mo.; Mus. V.; Par.; U. S.; staminate but mostly subflowering); *Degener* 10,300, Molokai, June 19, 1928 (Field, 2 sheets; subflowering).

Labordia Tinifolia var. κ **honolulensis** Sherff, Amer. Journ. Bot. 25: 584. 1938.

Principal leaves with blades more often 4–5.5 cm. long, the others often numerous and small with blades only 2–4 cm. long, all narrowly or moderately oblanceolate and at apex more often acuminate. Flowers unknown. Capsule black, valves 5–7 mm. tall including rostrum.

Type specimen: Collected by *Charles N. Forbes* (with *Mrs. G. E. Kelly*), no. 2,388–*O*, on Pacific Heights ridge, Oahu, August 1, 1916 (Bish.).

Distribution: Known only from type locality, northeastern part of Honolulu, Oahu.

Specimens examined: *Otto Degener* 10,254, Pauoa Flats, November 22, 1925 (Deg.; fruiting); *Forbes* 2,388–*O* (type, Bish.: cotypes, Berl.; Field; fruiting).

22. **Labordia kaalae** Forbes, Occas. Paps. 6: 174 and *pl.* 1916.

a. Branchlets (including those of inflorescence) glabrous or glabrate or at most papillate.
  b. Leaf-petioles usually 3–7 mm. long.
    c. Principal leaves more or less subtruncate at base; plant native of Oahu .... var. γ *brachypoda*.
    c. Principal leaves rounded-cuneate at base; plant native of Kauai .... var. ε *kauaiensis*.
  b. Leaf-petioles 0.8–2.5 cm. long.
    c. Leaf-blades 6–8 cm. long and 3.5–4.3 cm. wide; petioles thickish, ±1.5 cm. long; capsules obovoid . . var. δ *mendax*.
    c. Leaf-blades 8–10 cm. long and 4–5 cm. wide; petioles slender, up to 2.2 cm. long; capsules (submature) ovoid. var. β *Fosbergii*.

a. Branchlets (including those of inflorescence) and lower leaf-surfaces tomentulose or hispidulous.....*L. kaalae sensu stricto.*

A slender tree with dark bark, ±6 meters tall, branches divaricate; branchlets tomentulose or hispidulous, terete, grayish to purplish-black. Leaves petiolate; petioles slender, 0.8-2.5 cm. long, tomentulose; blades broadly elliptic-oblong to obovate-oblong, terminally broad or almost subrotund, at apex itself abruptly subacute, at base evenly or obliquely subtruncate and emarginate or subcordate, glabrous above, finely tomentulo-hispidulous beneath, membranaceous, 8-13 cm. long and 4-7 cm. wide, with commonly 8-10 principal lateral nerves to each side. Flowers greenish, numerous (9-25), in a pedunculate, paniculate, pubescent cyme; peduncle slender, 1-3.5 cm. long; bractlets subulate, 1-2 mm. long; calyx divided to middle or almost to base, pubescent, 3-4 mm. long, the erect or spreading lobes lanceolate-subulate or below middle more often ovate-dilated and frequently hyaline-margined down to their rounded or subauriculate base; corolla glabrous, green, its cylindric tube about 9-10 mm. long and in lower part about 4 mm. thick, the lobes triangular and about 2-3 mm. long; anthers partly exserted from corolla-tube; pistillode whitish-setulose on its ovary, 8-11 mm. long, the stylar portion capillary; capsule (submature) ovoid-globose, apically short-rostrate, 1.5 cm. tall (including the short rostrum, this under 1 mm. long), 2-valved, glabrous or glabrate, pale green.

Type specimen: Collected by *Charles N. Forbes*, no. 1,790-*O*, ridges of Puu Kaala at the head of Mokuleia Valley, Oahu, April 29, 1912 (Bish.).

Distribution: Known only from northwestern Oahu.

Specimens examined: *Otto Degener, Emilio Ordoñez, & J. Foster* 12,358, in dark forest, southeast slope of Puu Hapapa, June 4, 1939 (Berl.; Deg., Field; fruiting); *Forbes* 1,790-*O* (cotypes, Bish.; Mo.; staminate); *Francis R. Fosberg* 13,059 tree 6 meters tall, flowers green, in moist forest, alt. 550 meters, Pahole (Kukuiula) Gulch, near head of right branch, Waianae Mts., Mokuleia, April 12, 1936 (Bish.; Field; flowering and fruiting).

The capsules were unknown to Forbes but have since been collected in a submature state by Fosberg, from whose plants the fruiting characters have been described.

Labordia kaalae var. *β* **Fosbergii** Sherff, Amer. Journ. Bot. 25: 588. 1938.

Shrub 2–3 meters tall, branchlets and leaves pale green and very glabrous. Petioles 1–2.2 cm. long, blades 8–10 cm. long and 4–5 cm. wide. Inflorescence paniculate and lax, up to 12 cm. wide, ±22-flowered; peduncle slender, 4–6 cm. long. Capsule (submature) ovoid, about 1 cm. tall.

Type specimen: Collected by *Francis R. Fosberg*, no. 13,002 *pro parte*, shrub 2–3 meters tall, fruits greenish, on moist, wooded ridge, alt. 860 meters, east ridge of Puu Kalena, Waianae Mts., Waianaeuka, Oahu, March 22, 1936 (type, Bish.).

Distribution: Known only from type locality in northwestern Oahu.

Specimens examined: *Fosberg* 13,002 *pro parte* (type, Bish.; fruiting).

The variety was named in honor of Mr. Fosberg, who had already done much in the botanical exploration of the Hawaiian Islands and who had most generously placed his large collection of *Labordia* material in my hands for study.

Labordia kaalae var. γ **brachypoda** Sherff, Amer. Journ. Bot. 25: 588. 1938.

Petioles 3–7 mm. long; blades 5–8 cm. long and 2–4.8 cm. wide, glabrous on both surfaces, principai lateral nerves about 7 to a single side. Inflorescence 3–5-flowered. Sepals glabrous, 1–2 mm. long, not diaphanous at margins. Capsules (submature) conic-ovoid, at apex subrostrate, black when dry, glabrous or glabrate, about 1.2 cm. long.

Type specimen: Collected by *Charles N. Forbes*, no. 1,587–*O*, Popouwela, Waianae Mts., Oahu, April 27, 1910 (Bish., 2 sheets).

Distribution: Known only from type locality in northwestern Oahu.

Specimens examined: *Forbes* 1,587–*O* (type, Bish., 2 sheets: cotype, Mo.; fruiting).

The type and cotype had been variously suspected by Forbes of being his *L. kaalae*, of representing a variety of *L. triflora* Hillebr., or of being typical *L. triflora* Hillebr. and (in Forbes' judgment) perhaps meriting, as such, a varietal status under *L. Tinifolia* A. Gray. The frequently cordate leaf-bases, the simpler inflorescence with its 3–5 instead of 10–15 or more flowers, the larger and more conic-pointed capsules, etc. all separate var. *brachypoda* from *L. Tinifolia*. The frequently contracted bases and the broader and more or less obtuse (not acuminate) apices of the more rigid leaf-blades, the longer petioles (commonly 3–7 mm. long, not 1–2 mm. long or almost lacking), the much shorter (1–2.7 cm. not 3–5 cm. long) and thicker peduncles, etc. distinguish var. *brachypoda* easily from *L. triflora.* The shorter leaf-petioles (3–7 mm. not 0.8–2.1 cm. long), smaller leaf-blades (5–8 cm. not commonly 8–13 cm. long, 2–4.8 cm. not 4–7 cm. wide) with their glabrous, not finely tomentose, lower surfaces and their usually 7 not commonly 8 to 10 principal lateral nerves to each side, the few flowers (3–5 not 9–25 in a cyme), their conic-ovoid apically narrowed and rostrate 10–12 (or more) mm. long (not obovate-globose apically short-mucronate 8–9 mm. long) capsules, and doubtless other characters will separate var. *brachypoda* from *L. kaalae* proper.

Labordia kaalae var. δ **mendax** Sherff, Amer. Journ. Bot. 25: 589. 1938.

Glabrate or glabrous; blades 6–8 cm. long and 3.5–4.3 cm. wide, petioles rather thickish and about 1.5 cm. long. Sepals dorsally glabrous, the edges diaphanous below. Capsules obovoid, 8–9 (even –10) mm. tall.

Type specimen: Collected by *Alfred Meebold,* alt. 3,800 feet, Makaleha ridge, Kaala, Waianae Mts., Oahu, June, 1932 (Bish.).

Distribution: Known only from type locality in northwestern Oahu.

Specimens examined: *Meebold,* alt. 3,800 feet, etc. (type, Bish.; fruiting).

In its leaves and fruits this variety somewhat suggests *Labordia Tinifolia* A. Gray.

Labordia kaalae var. ε **kauaiensis** var. nov.

Glabra. Foliorum petioli 5–7 (rarius –10) cm. longi; laminis oblongo-ovalibus, apice subacutis vel subacuminatis, basi rotundo-cuneatis, coriaceis. Calyx extus glaber, circ. 2 mm. altus; sepalis triangulato-ovatis vel supra subulatis infra moderate dilatatis, margine non vel vix diaphanis sed minutissime ciliatis.

Glabrous. Leaf-petioles 5–7 (more rarely –10) cm. long; -blades oblong-oval, at apex subacute or subacuminate, at base rounded-cuneate, coriaceous. Calyx externally glabrous, about 2 mm. tall; sepals triangulate-ovate or above subulate and below moderately dilated, at margin not or scarcely diaphanous but very minutely ciliate.

Type specimen: Collected by *Charles N. Forbes, sine num.*, Kauai (Bish.).

Distribution: Kauai, exact locality unknown.

Specimens examined: *Forbes*, Kauai (type, Bish.; subflowering).

23. **Labordia decurrens** Sherff, Amer. Journ. Bot. 25: 581. 1938.

Shrub or small tree; branchlets very delicate, grayish-brown, subterete, glabrous or moderately papillate; stipules subobsolete, only about 1 mm. tall. Leaves large; petiole flat or toward base conduplicate, 1–2.5 cm. long; blade broadly subspatulate-lanceolate, 1–1.8 dm. long and 2–5 cm. wide, gradually narrowed below the middle to the more or less decurrent base, at apex acute or subacuminate, very membranaceous, glabrous, the median vein flat and about 1.5 mm. wide. Inflorescence paniculate-cymose, glabrous, ±6 cm. tall and ±7 cm. wide, finally up to about 15-fruited, its primary branches opposite and divaricate, the ultimate pedicels very delicate and commonly 1–1.5 cm. long. Flowers at anthesis not seen. Sepals finally spreading or subreflexed, lanceolate-triangulate, glabrous or at margins setulose, at apex more or less acute, about 1.5 mm. long. Capsules globose-obovoid, numerous and 6–7 mm. tall or few and ±9 mm. tall, black when dry, 2-valved, at apex very minutely rostrate, externally scrobiculate-rugulose but otherwise glabrous, valves not carinate.

Type specimen: Collected by *Horace Mann* and *William T. Brigham*, no. 610 *pro parte*, Oahu, May 4, 1864–May 18, 1865 (Mo.).

Distribution: Oahu.

Specimens examined: *Mann & Brigham* 610 *pro parte* (type, Mo.: cotypes, Corn.; Field; fruiting).

This species was confused by Mann with *Labordia Tinifolia* A. Gray. Indeed, Mann not only labeled the specimens of the type collection *L. Tinifolia* but applied his collection number 610 also to two other specimens (Bish.; Gray), both of which are true *L. Tinifolia*. *L. decurrens* differs enough, however, in the characters noted to be distinguished very easily from that species. The type collection lacks flowers, but the fruiting calyces are similar to those of *L. Tinifolia*.

SPECIES EXCLUDED

Labordia(?) Fauriei Lévl. *in* Fedde Repert. 10: 157. 1911. =*Calpidea Brunoniana* Endl. *fide* Rock *in* Fedde *op. cit.* 13: 352 *et* 353. 1914.

INDEX OF COLLECTORS CITED

Collectors' names and page numbers in *italic type*

Anonymous, Mts. of Punaluu, Aug. 18, 1908, *484*
(*Otto Degener* distrib. no. 10241), *533*, *534*

Bean, Ross S. (*Otto Degener* distrib. no. 10877), *497*
Bergman, H. F., alt. 1,700 ft., on slopes of Keeaumakua, Feb. 22, 1928, *475*
Bryan, Jr., Edwin H., no. 639, *494*
no. 837, *506*
Bryan, L. W., alt. 2,500 ft., land of Manuka, Feb., 1933, *531*

Cranwell, Miss Lucy May, nos. 3403, 3503, *494*
Cranwell, Lucy May, Olof Hugo Selling, & Carl Skottsberg, no. 2671 p.p., *494*, *519*
nos. 2671*b*, 2671*c*, *494*
nos. 2827, 2975, *523*
nos. 3166*a*, 3166*b*, *492*
no. 3256, *500*
Curran, Hugh McCollum, no. 66, *536*

Degener, Otto, in extreme rain-forest, Koolau Gap, June 17, 1927, *520*
Molokai, May 25, 1928, *538*
Oahu, Jul. 29, 1935, *475*
(field no. 302,) Oahu, Jul. 29, 1935, *469*
no. 1599, *500*
nos. 9841, 10300, *531*
nos. 10245, 10246, *497*
no. 10247, *484*
no. 10248, *513*, *514*
no. 10249, *523*
no. 10250, *524*
no. 10251, *537*
nos. 10252, 10256, 10257, *514*
nos. 10253, 10280, *522*
no. 10254, *538*
nos. 10255, 10260, *534*
nos. 10258, 10259, 10266, 10274, 10301, *494*
nos. 10262, 10265, 10269, 10271, 10302, *520*
no. 10264, *504*
nos. 10267, 10268, 10270, *502*
no. 10272, *537*, *538*
nos. 10273, 10277, *518*
nos. 10275, 10276, 10281, *467*
nos. 10278, 10279, *470*
no. 10282, *471*
no. 10300, *538*
Degener, Otto, & Yasuma Iwasaki, no. 10242, *497*
Degener, Otto, Yasuma Iwasaki, Brumaghim, & Edwin B. Bartram, no. 10243, *497*
Degener, Otto, Martin (=Tiburcio) Martinez, & Felix C. Salucop, no. 11124, *475*
Degener, Otto, R. Northwood, & J. Foster, no. 12295, *484*
Degener, Otto, & Emilio Ordoñez, nos. 12059, 12061, *481*
nos. 12062, 12063, *469*
Degener, Otto, Emilio Ordoñez, & J. Foster, no. 12336, *485*
no. 12336*a*, *485*, *486*
no. 12356, *486*
no. 12358, *539*
Degener, Otto, & Kwan Kee Park, no. 10244, *484*
Degener, Otto, Kwan Kee Park, William Bush, & Colin Potter, no. 10151, *469*
Degener, Otto, Kwan Kee Park, William Bush, Colin Potter, & D. LeRoy Topping, no. 10021, *508*
no. 10120 *pro parte*, *469*, *485*
no. 10121, *481*
Degener, Otto, Kwan Kee Park, & Wallace Hirai, no. 10237, *477*
Degener, Otto, Kwan Kee Park, & Manuel Kwon, no. 10238, *475*
Degener, Otto, Kwan Kee Park, & Yoshimasa Nitta, no. 4174, *508*
no. 10234, *475*
no. 10235, *475*
nos. 10334, 10335, *481*
Degener, Otto, Kwan Kee Park, Colin Potter, & William Bush, no. 10152, *474*
no. 10152*a*, *501*
Degener, Otto, Kwan Kee Park, Colin Potter, William Bush, & D. LeRoy Topping, nos. 10000, 10001, *508*
Degener, Otto, Kwan Kee Park, & Gordon Shigeura, no. 10017, *508*
Degener, Otto, Kwan Kee Park, D. LeRoy Topping, & William Bush, no. 10236, *484*
Degener, Otto, Kwan Kee Park, D. LeRoy Topping, William Bush, & Colin Potter, no. 10284, *486*
Degener, Otto, Felix C. Salucop, & Valentin (Valentine) Arlantico, nos. 11550, 11552, *478*
no. 11553, *501*
no. 11568, *469*
no. 12019, *531*
no. 12020, *483*
Degener, Otto, Gordon Shigeura, & D. LeRoy Topping, no. 10065, *531*

- *Degener, Otto, Takamoto, & Martin (=Tiburcio) Martinez,* no. 10542, *501*
- *Degener, Otto, & D. LeRoy Topping,* no. 10263, *502*

- *Ewart, G. R. III,* nos. 97, 114, *494*

- *Faurie, Abbé Urbain,* no. 452, *524*
  - no. 536, *536*
  - no. 537, *531*
- *Forbes, Charles Noyes,* East Maui? 1920? *489*
  - Kauai, *542*
  - Koolauloa Mts., between Punaluu and Kaipapau, Nov. 14–21, 1908, *508*
  - Makaha Valley, Feb. 12–19, 1909, *508*
  - Kaaawa Valley ridges, May 30, 1909, *484*
  - (with *Dr. C. Montague Cooke,*) Koolau Mts., between Punaluu and Kaipapau, May 3–8, 1909, *478*
  - Nahiku, Jul., 1910, *494*
  - Lanai, Mar. 9, 1916, *535*
  - Keanae Gap, Aug. 7, 1919, *502*
  - nos. 4-*L*, 79-*L*, 267-*L*, 281-*L*, *535*
  - (with *Dr. C. Montague Cooke, Jr.*), no. 9-*M*, *494*
  - nos. 27-*L*, 206-*L*, 242-*L*, *468*
  - (with *C. Dole,*) 41-*K*, *488*
  - nos. 42-*M*, 102-*M*, 204-*Mo*, 257-*M*, 332-*Mo*, 387-*M*, *494*
  - no. 43-*M*, *521*
  - no. 103-*M*, *519*
  - nos. 138-*Mo*, 168-*Mo*, 291-*Mo*, 332-*Mo*, *467*
  - no. 152-*M*, *502*, *503*
  - nos. 160-*M*, 207-*M*, 741-*M*, 750-*M*, 925-*M*, 1153-*M*, *520*
  - nos. 179-*K*, 204-*K*, *525*
  - no. 244-*M*, *509*
  - no. 256-*K*, *488*
  - nos. 298-*H*, 509-*H*, 721-*H*, 723-*H*, 726-*H*, *492*
  - nos. 331-*K*, 405-*K*, 896-*K*, 904-*K*, 910-*K*, *524*
  - nos. 346-*K*, 980-*K*, 987-*K*, 1044-*K*, *514*
  - nos. 369-*L*, 2544-*M*, 2586-*M*, 2588-*M*, *518*
  - no. 378-*K*, *527*
  - no. 503-*Mo*, *465*
  - no. 553-*Mo*, *536*
  - nos. 637-*M*, 760-*M*, 762-*M*, 882-*M*, 888-*M*, 963-*M*, 1080-*M*, 1237-*M*, *502*
  - no. 689-*K*, *487*
  - nos. 721-*K*, 962-*K*, 1133-*K*, *528*
  - no. 752-*H*, *497*
  - nos. 905-*K*, 938-*K*, 1153-*K*, *490*
  - no. 980-*K*, *514*
  - no. 1253-*M*, *503*
  - no. 1440-*O*, *476*
  - no. 1486-*O*, *512*
  - no. 1587-*O*, *540*
  - nos. 1602-*O*, 1844-*O*, 2327-*M*, *531*
  - nos. 1602-*O*, 2306-*M*, *534*
  - no. 1644-*M*, *506*
  - nos. 1688-*M*, 2443-*M*, 2565-*M*, 2650-*M*, 2652-*M*, 2680-*M*, *495*
  - no. 1790-*O*, *539*
  - (with *Dean Lake,*) no. 1980-*O*, *475*
  - nos. 2208-*O*, 2552-*O*, *478*
  - (with *Mr. Labouchere,*) 2288-*O*, *475*
  - (with *Mr. Labouchere,*) 2293-*O*, *531*
  - (with *Mrs. G. E. Kelly,*) 2388-*O*, *538*
  - (with *J. C. Bridwell,*) 2438-*O*, *512*
- *Forbes, Charles Noyes, & C. L. Thompson,* Makaha Valley, May 3–8, 1909, *508*
  - Koolau Mts., between Punaluu and Kaipapau, May 8–13, 1909, *475*
- *Fosberg, Francis Raymond,* no. 8698, *478*
  - nos. 8699, 8714, 9723, 9725, 9741, 13860, *479*
  - nos. 8714, 10896, *477*
  - no. 9402, *484*
  - nos. 9551, 10345, 14234, *508*
  - no. 9729, *501*
  - no. 9738, *469*
  - no. 10044, *495*
  - no. 10102, *499*
  - nos. 10367*a*, 10369, *483*
  - no. 10369, *482*, *483*
  - no. 10896, *475*
  - no. 10965, *471*
  - no. 12249, *481*
  - no. 12676, *514*
  - no. 12756, *524*
  - no. 13002 p.p., *531*, *540*
  - no. 13013, *483*
  - no. 13059, *539*
  - no. 13550, *512*
- *Fosberg, Francis Raymond, & V. O. Fosberg,* no. 13736, *475*
  - nos. 13737, 14195, *532*
- *Fosberg, Francis Raymond, & Edward Yataro Hosaka,* nos. 13914, 13917, 13919, 13921, *479*
  - no. 13922, *477*
  - no. 13979, *475*
  - no. 14001, *532*
- *Fosberg, Mrs. Violet Oliveira,* no. 54, *492*

- *Gaudichaud, Charles,* alt. 2,700–3,000 ft., Oahu, 1819, *473*

- *Harris, J. Arthur,* no. C242120, *483*
- *Heller, Amos Arthur,* no. 2579, *526*
  - no. 2868, *527*, *528*

- *Hillebrand, William*, Hawaiian Isls., *467, 485, 495, 512, 518, 528*
  - Hawaii, 1868, *535*
  - Lanai, 1870, *518*
  - Lanai, July, 1870, *468, 495, 518, 535*
  - Maui (West), July, 1858, *495*
  - Maui (West), 1870, *495*
  - Molokai, *518, 528*
  - Molokai, 1870, *518*
  - Oahu, valley on, Sept., 1860, *532*
  - "Eke Crater," Aug., 1870, *495*
  - Halawa, *465*
  - Haleakala, *495*
  - Kaala, *485*
  - Kaanapali, *535*
  - Kaanapali, Aug., 1870, *519*
  - Kalae, *467*
  - Kalaupapa Pali, *533*
  - Makawao beyond Pumelei, July, 1858, *532*
  - Mapulehu, Valley of, *467*
  - Mopulehu (Mapulehu), July, 1870, *528*
  - Nuuanu, western ridge of, Dec., 1869, *469*
  - Olualu (Olowalu), Aug., 1870, *532*
  - Palolo, *512*
  - Pauoa, Jan., 1870, *512*
  - Pelekunu, Heights of, *495*
  - Pelekunu, heights near Pali of, July, 1870, *518*
  - Wahiawa, April, *508*
  - Waihee, Valley of, August, 1870, *505*
  - Wailau, Pali of, *467*
  - Wailuku, *505*
  - Wailupe, *479, 534*
  - Wailupe, 1870, *534*
  - Wailupe Valley, Apr., 1870, *512*
  - Waipahia, peak of, *479*
  - no. 404, *532*
- *Hillebrand, William, & Rev. John M. Lydgate*, Maui (West), *519*
  - Oahu, *479, 512*
  - Hilo, *520*
  - Pauoa, *532*
  - Wailupe, *512*
  - no. 95, *532*
  - no. 97, *518*
- *Hitchcock, Albert Spear*, no. 15459, *524*
- *Hosaka, Edward Yataro*, Waikakalaua Gulch, Apr. 6, 1930, *508*
  - nos. 598, 679, 1139, 1195, *479*
  - nos. 602, 1002, 1062, 1063, *508*
  - no. 678, *469*
  - no. 679, *501*
  - nos. 946, 968, 2033, 2034, *477*
- *Hosaka, Edward Yataro, & Francis Raymond Fosberg*, nos. 1871, 1918, *482*
  - nos. 1875, 1880, 1881, *480*
- *Hume, Edward P.*, no. 42, *471*
  - nos. 79, 439, *475*
  - no. 556, *481, 482*
  - no. 558, *509*

- *Judd, Charles Sheldon*, (*Otto Degener* distrib.) no. 10116, *482*

- *Knudsen, Valdemar*, no. 199, *527*

- *Lydgate, Rev. John M.*, Hilo, *492, 495*
  - Hilo, in woods, Apr., 1871, *520*
  - Kaholuamanu, *490*
  - Wahiawa Mts., *525*

- *Mann, Horace, & William T. Brigham*, Oahu, *480*
  - no. 149, *511, 512*
  - no. 335, *517, 518*
  - no. 434, *495, 496, 498*
  - no. 562, *534*
  - no. 610 p.p., *532, 542*
  - no. 611, *487*
  - no. 738, *532*
- *Meebold, Alfred*, alt. 3,800 ft., Makaleha ridge, Kaala, June, 1932, *541*
  - (*Otto Degener* distrib.) no. 10239, *483*
- *Munro, George C.*, Puu Kukui, Sept. 25, 1916, *495*
  - nos. 35, 430, 432, *535*
  - nos. 229, 413, 449, *468*
  - no. 237, *518*
  - no. 572, *467*
  - nos. 610, 620, *495*

- *Remy, Jules*, nos. 320, 361, *532*
  - no. 343*bis*, *480*
  - no. 358*bis*, *508*
  - no. 360, *531, 532*
  - no. 361*bis*, *531, 536*
  - no. 362, *492, 493, 498*
  - no. 363, *465*
  - no. 363*bis*, *510*
- *Rock, Joseph Francis Charles*, Haleakala, *532*
  - Honomanu, May, 1911, *495, 513*
  - Honomanu Trail, May, 1911, *532*
  - Kailua Ditch, May, 1911, *509*
  - Kailua ditch trail, Waikamoi, May, 1911, *532*
  - Kauai, Oct., 1916, *490*
  - Keanae, *509*
  - Molokai, *518*
  - Mt. Olympus Trail, 1912, *515*
  - Nahiku, May, 1911, *509, 510*
  - Nahiku Stream, May, 1911, *504*
  - Waikamoi ditch trail, Ukulele, Sept., 1910, *513*
  - Wailau Pali, 1910, *518*
  - nos. 4301, 4305, 8316, 8364, 8430, 10017, *493*
  - nos. 4873, 5250, 5251, 5252, 5892, 5894, 5898, 5899, 8885, *524*
  - nos. 4874, 5813, 8884, *490*

nos. 5247, 5916, *515*
nos. 5887, 5888, 5890, 5891, 5912, 17103, *528*
nos. 7044, 12577, 16015, 17136, *467*
nos. 7045, 7069, *518*
nos. 8000, 8099, 8169, *535*
nos. 8017, 8020, 8041, 8153 p.p., 8155, 8185, 8538, *495*
no. 8151, *519*
no. 8152, *519*
no. 8153 p.p., *521*
no. 8538, *503*
no. 8616, *536*
no. 8626, *520*
no. 8627, *502*, *503*
no. 10015, *496*, *497*
no. 10344, *505*, *506*
no. 14062, *532*, *533*, *534*
no. 16012, *521*

Rock, Joseph F. C., & Hashimoto, "Eke-Honokahau," Aug., 1910, *496*

Rock, Joseph F. C., & Shaw, Konahuanui, Sept., 1912, *469*

Saint-John, Harold, no. 10074, *476*
no. 10228, *496*
no. 10464, *509*
no. 12214, *471*
no. 17605, *483*

Saint-John, Harold, & Francis Raymond Fosberg, no. 13576, *487*

Saint-John, Harold, Francis Raymond Fosberg, & Oliveira, no. 13810, *527*

Saint-John, Harold, & Edward Yataro Hosaka, no. 10567, *509*
no. 11483 *A.H.*, *493*

Saint-John, Hosaka, Hume, et alii, no. 10734, *524*
no. 10990, *527*

Saint-John, Ross S. Bean, & Edward Yataro Hosaka, no. 11212, *497*

Selling, Olof Hugo, no. 3101, *515*
no. 3954, *471*

Skottsberg, Carl, no. 590, *499*
no. 743, *494*, *495*
no. 959, *524*
no. 964, *490*
no. 1850, *469*

Swezey, Otto H., Lanihuli, June, 1919, *480*

Topping, D. LeRoy, (Otto Degener distrib.) no. 2859, *471*

United States Exploring Expedition, Hawaiian Isls., 1840, *532*
Hawaii, 1840, *497*
Oahu, 1840, *478*, *479*, *480*

Wawra, Heinrich, no. 2120, *523*, *524*
no. 2164, *490*
no. 2200*b*, *503*, *504*
no. 2252, *509*
no. 2283, *534*
no. 2284, *512*

Wichman, Mrs. Juliet, no. 2940, *514*

Yamaguchi, Michio, no. 1256 p.p., *469*, *477*

ADDITIONAL STUDIES OF THE HAWAIIAN EUPHORBIACEAE

EARL EDWARD SHERFF

In a former paper (Revision of the Hawaiian species of *Euphorbia* L., Annals Missouri Bot. Gard. 25: 1–94, *pls. 2–11.* 1938), I have presented a monographic treatment of the species of *Euphorbia* L. indigenous or adventive in the Hawaiian Islands. In the present paper are set forth a revision of the Hawaiian species of *Claoxylon* and various additional results growing out of my recent studies of Hawaiian material in the genera *Aleurites, Drypetes, Phyllanthus, Antidesma,* and *Euphorbia.* During the progress of my work, many herbarium specimens have been made available to me, chiefly by the same institutions and individuals cited in the preface to the foregoing paper on *Labordia.* To all of these institutions and individuals I take this opportunity of expressing again my indebtedness and gratitude.

THE HAWAIIAN SPECIES OF THE GENUS CLAOXYLON A. Jussieu

The genus *Claoxylon* A. Juss. (Tent. Euphorb. 43, *tab. 14, fig. 43.* 1824) was divided into five sections by Johannes Mueller of Argovie (or Aargau; DC. Prodr. 15^{II}: 775–790. 1866). In the fourth of these, *Gymnoclaoxylon* Muell. Arg. (Linnaea 34: 165. 1865), he included the one Hawaiian species known to him, namely, *Claoxylon sandwicense* Muell. Arg. This he separated from the lone other species in that section, *C. fallax* Muell. Arg. of the Fiji Islands, by the fact that it had about 200 stamens in a single staminate flower, while *C. fallax* had about 30. Mueller's treatment of *Claoxylon* is repeated, in abridged form, by Engler and Prantl (Natürl. Pflanzenfam. 3^{V}: 48. 1896). For the synonymy of the genus the reader may consult Mueller Arg., also Bentham and Hooker (Gen. Pl. 3: 309. 1880). It may be noted here, however, that in recent years numerous additional species within the genus have been proposed. Thus the number of known species has been increased from the forty-two described by Mueller Arg. to ninety or more at the present time (cf.

F. Brown, Bernice P. Bishop Mus. Bull. 130: 148. 1935: "Approximately 90 species centering in Africa; well represented in Malaysia; relatively few species in Asia, the islands of the Indian Ocean, Australia, or Polynesia; absent from America"). The three Hawaiian species included in the present revisional treatment all belong to the section *Gymnoclaoxylon* Muell. Arg., described by its author as having: staminate receptacle entirely eglandular, accompanied neither by an extrastamineal disc nor by juxtastamineal glands; anthers extrorsely 2-fissured.

Genus **CLAOXYLON** A. Juss.: Description

A. Jussieu, Tent. Euphorb. 43, *tab. 14, fig. 43.* 1824.

Trees or shrubs or more rarely herbs, glabrous or appressedly short-pubescent. Leaves alternate, simple, stipulate, penninerved, often purplish or subviolet-reddish, subtended by 2–4 more or less distinctly denticuliform and at times caducous stipules, never maculate-glandular beneath, commonly large, membranaceous or scarcely coriaceous, in our species, at least, smooth in live state but when dry minutely scabrid especially on lower surface. Spikes or racemes axillary or lateral, solitary or subfasciculate, shorter than the leaves. Flowers dioecious or more rarely but in our species probably always monoecious, apetalous. *Staminate flowers:* Calyx of 3 or 4 segments, subglobose and valvate in the bud, usually more or less closed. Stamens usually numerous, centrally affixed to the receptacle and variously associated with its glands (these, when present, now covering the entire receptacle and being dispersed among the bases of the filaments, now surrounding the receptacle and being coalesced with it, or at times being arranged according to both plans in the same flower); anther-cells distinct except at their base, erect, obovoid or subglobose, lengthwise (now introrsely now extrorsely) dehiscent from their apex; filaments free, short. Rudiment of ovary lacking. *Pistillate flowers:* Calyx less deeply divided, its 2–4 lobes always or at least often valvate and alternating with glands. Receptacle marginally entire or lobed. Ovary 3- or more rarely 2-celled, a single ovule in each cell. Styles as many as the ovary-cells, simple, short, free or at base connate, spreading, on inner surface plumose or coarsely papillate-stigmatose or more rarely smoothish. Capsule dividing into 2-valved cocci. Seeds estrophiolate, subglobose, often (their epidermis having become loosened) purplish-red, involute; testa now foveolate-depressed, now scrobiculate-roughened; albumen (perisperm) fleshy; cotyledons broad, flat.

ABBREVIATIONS USED FOR HERBARIA CITED

(See p. 464)

KEY

a. Leaves ±3 dm. long and ±1.1 dm. wide; capsules about 2.5 cm. wide and 1.2–1.6 cm. tall; plant from Hawaii.....3. *C. Remyi.*

a. Leaves and capsules much smaller.

  b. Leaves, when full grown, densely short-tomentulose with arcuate, yellowish-brown setulae...........1. *C. Helleri.*

  b. Leaves, when full grown, glabrate or at most moderately or on veins densely appressed-hispid.
2. *C. sandwicense* and vars.

1. **Claoxylon Helleri** Sherff, Amer. Journ. Bot. 24: 88. 1937.

Claoxylon tomentosum Heller, Minn. Bot. Studs. 1: 843. 1897 (*exclud. syn.* Hellebr.).

Small tree, in habit probably similar to *C. sandwicense;* branchlets yellowish-green when dry, their leaf scars marginally more or less hispid. Leaves yellow-green when dry, petiolate; petiole slender, shortly and softly tomentulose, 2–5 cm. long; blade elliptic-oblong or -ovate, apically obtuse or truncate-emarginate, basally rounded or at first broadly cuneate, at margin sharply and numerously denticulate with calloused and more or less hispidulous teeth, 9–14 cm. long and 5.5–9 cm. wide, rigidly membranaceous, scabrid above, softly and densely tomentose beneath. Stipules not seen. Flowers without doubt monoecious, in axillary depauperate few-noded racemes (nodes with alternate areolate minutely hispid-bracteate commonly 1- or 2-flowered glomerules; rachis subappressedly antrorse-hispid, about 1–1.3 mm. thick); staminate flowers pedicellate (pedicel appressedly antrorse-hispidulous and up to 1.5 cm. long), deeply 3-parted (sepals ovate, at apex acute or subacute, on outer surface densely and antrorsely yellow-hispid, on inner scabrid-glabrate and obscurely 1–7-nerved, 5–6 mm. long, at anthesis spreading), stamens violaceous, ±200; pistillate flowers (a single one observed, this with fruit) deeply 3-parted (sepals smaller than the similar sepals of the staminate flowers—in fact only 3–3.5 mm. long), the minute oblong-linear purplish-black glands only about 1–1.5 mm. long, the dark purple subsparsely and appressedly antrorse-hispid capsule 3-celled (cocci outwardly rounded), about 5 mm. tall and ±5 mm. thick (a single mature seed observed; this ovoid-globose, reddish-gray, wrinkled, scarcely 3.5 mm. long).

Type specimen: Collected by *Amos Arthur Heller*, no. 2,878, on the edge of the plateau above Waimea, Kauai, October 15, 1895 (Field).

Distribution: Southwestern Kauai.

Specimens examined: *Heller* 2,878 (type, Field: cotypes, Berl.; Bish.; Gray; Kew; Par.).

For remarks about this species, see under *C. sandwicense* var. *tomentosum* (p. 555).

2. **Claoxylon sandwicense** Muell. Arg. Linnaea 34: 165. 1865; *in* DC. Prodr. 15^{II}: 780. 1866.

a. Leaves ventrally somewhat pilose especially along veins or finally glabrate.
  b. Leaf-blades 7–10 rarely –13 cm. long and 2–3 rarely a few –5.5 cm. wide, finally glabrate even around teeth; plant of East Maui .... *C. sandwicense sensu stricto.*
  b. Leaf-blades larger or proportionately broader.
    c. Leaf-blades broadly oblong or even subrotund, larger ones 6–9 cm. long and 5–7.5 cm. wide .... var. ζ *Degeneri.*
    c. Leaf-blades proportionately narrower.
      d. Flowers singly disposed or in fascicles of 2–5.
        e. Rachis and pedicels of inflorescence pubescent. var. β *magnifolium.*
        e. Rachis and pedicels of inflorescence becoming glabrate or even glabrous .... var. ε *glabrescens.*
      d. Flowers commonly 7–15 in a fascicle; native of northwestern Hawaii .... var. γ *Hillebrandii.*
a. Leaves ventrally tomentose or when full grown moderately appressed-hispid; native of western Kauai . . var. δ *tomentosum.*

Small tree; branchlets densely foliose and brownish-hispid at apex, presently glabrate. Leaf-petiole usually under 2 cm. long, somewhat rigid, brownish-hispid; blade narrowly spatulate-obovate, shortly and obtusely acuminate, gradually narrowed to an acute or subacute base, rigidly membranaceous, glandular-denticulate along the more or less narrow-indurate edges, opaque, scabrid, yellowish-green at least when dry, finally glabrate (even around the teeth), 7–10 cm. long and 2–3 cm. wide (or larger on leaves of young plants or of sterile branches), the veins subobscure above but moderately visible beneath (commonly yellow-brown on drying, as also the petiole). Flowers monoecious. Racemes up to 5.5 cm. long, axis at first brownish-hispid with antrorse and appressed hairs but presently glabrate, terminal flower perhaps pistillate but rest mostly staminate. *Staminate flowers:* Calyx about 4–6 mm. across before anthesis and up to 7.5 mm. tall, appressedly and antrorsely short-hispid on outer surface, glabrate within, mostly exceeded by pedicel; sepals deltoid-ovate, narrowed above, acute at apex. *Pistillate flowers:* Calyx similar but smaller, the sepals only 1.5–2.5 mm. long and subobtuse at apex; glands oblong-linear, purplish-black, equaling the sepals; capsule purple, glabrate, 4.5–5 mm. across and 3–4 mm. tall, deeply 3-parted, locules rounded.

Type specimen: Collected by *Charles Gaudichaud,* Hawaiian Islands, 1836 (Del.).

Distribution: Southwestern corner of East Maui.

Specimens examined: *Gaudichaud,* Hawaiian Isls. (Berl.; Par.); *Gaudichaud,* Hawaiian Isls., October, 1836 (Del., type or cotype specimen); *Gaudichaud* 392, September and October, 1836 (Field; Par., 2 sheets); *George C. Munro* 393, at or near Ulupalakua, February 12, 1913 (Bish.); *Charles N. Forbes* 1,971–*M*, Auwahi, south slope of Haleakala, March 15, 1920 (Berl.; Bish.; Del.; Field; Gray; Kew; N. Y.); *Joseph F. Rock* 8,675, alt. 3,000 feet, lava fields, Auahi (i.e., Auwahi; Bish.; Field).

Claoxylon sandwicense var. β **magnifolium** Sherff, Amer. Journ. Bot. 24: 88. 1937.

Fruticose or arborescent, 3–4.5 meters tall, wood soft; branches pale and spreading, their terminal portions at first appressed-hairy but presently glabrate. Leaf-petiole slender, subrigid, glabrate or more often sparsely and antrorse-appressedly brown-pilose, 2–5 cm. long; blade moderately to widely obovate-oblong, at apex obtuse or shortly acuminate, mostly cuneate-contracted toward base, marginally crenate-serrate or -denticulate (tips of teeth indurated, often inflexed, often surrounded by a circular row of stiff, straightish hairs, more or less glandular), stiff-membranaceous, dorsally scabrid-papillose and sometimes beset with a very few appressed hairs, ventrally somewhat antrorse-pilose especially along midvein and lesser veins with appressed and exceedingly slender hairs or finally glabrate, 8–26 cm. long and 4–7.5 cm. wide. Stipules (*fide auct.*) ±4 mm. long, caducous. Flowers monoecious, mostly clustered in distant fascicles of 2–5 and minutely bracteate in axillary racemes (these 2–10 cm. long), their pedicels pubescent and 3–15 mm. long, the terminal flower of the extreme or sometimes of several fascicles being pistillate, sometimes only one or few pistillate flowers (without staminate) at and near the end of a much shorter rachis (*fide Hillebr.*). Ovary more or less setose especially above, styles spreading-recurved. Capsule antrorsely white-setose unless toward base, 5–6 mm. across and 4–5 mm. tall; seeds globose, rugose-scrobiculate, grayish over red, 2.6–3 mm. long.

Type specimen: Collected by *Edward Y. Hosaka*, no. 144, alt. 1,500 feet, Waianaeuka, Puu Kaala, Oahu, February 2, 1930 (Bish.).

Distribution: Kauai, Oahu, Molokai, Lanai, West Maui, and Hawaii.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2,852, Kokee region, Kauai, August 13, 1938 (Goth.); *Hattie Davis*, alt. 2,500 feet, in the forest of Puu Kaala, Waianaeuka, Oahu, January 8, 1933 (Bish.); *Otto Degener* 3,718, in dark, wet jungle, between Glenwood and 29 Miles, Hawaii, June 15, 1929 (Berl.; Deg.; Del.; Field; Gray; Kew); *Degener* 7,994*a*, at base of Puu Kaala, near end of Schofield Fire-Break Trail, Oahu, March 13, 1932 (Berl.; Brit.; Deg.; Del.; Field; Gray; Kew; Mo.; Mun.; Par.);[1] *Degener* 7,994*b*, in dense, wet woods, same locality and date (Deg.); *Degener* 7,997, Oahu, October 9, 1932 (Berl.; Deg.; Field); *Degener* 7,999, in dense, rich woods, at base of Puu Kaala, near end of Schofield Fire-Break Trail, Oahu, February 11, 1928 (Berl.; Brit.; Deg.; Del.; Field; Gray; Kew; Mo.; Mun.; N. Y.); *Degener* 8,000, in dark, rich jungle, between Glenwood and 29 Miles, Hawaii, June 24, 1929 (Deg.); *Degener* 8,001, small tree in ravine, mountains *mauka* of Wahiawa, Oahu, November 25, 1926 (Berl.; Deg.; Field); *Degener* 8,002, in jungle, between Glenwood and 29 Miles, Hawaii, July 24, 1926 (Berl.; Deg.; Field; Gray; Par.); *Degener* 8,003 *pro parte*, in forest, along Kalalau Trail near Kokee, Kauai, July 4, 1926 (Deg.; Field; *cum var. tomentoso commixt.*); *Degener, Park, Potter, Bush, & Topping* 9,958, in forest, west side of Makaleha Valley, Oahu, July 21, 1935 (Degener); *Degener, Park, Y. Nitta, & Bush* 7,993, two trees seen in shaded gulch, monoecious, leaves pale on both sides, anthers pale blue, on north slope of South Halawa Gulch, Oahu, April 17, 1932 (Berl.; Brit.; Deg.; Del.; Field; Goth.; Gray; Kew; Mo.; Mun.; Mus. V.; N. Y.; Par.; U. S.); *Charles N. Forbes*, Waiopaa, Lanai, September 18, 1916 (Bish.); *Forbes* 74–*Mo*, Kalae, Molokai, June, 1912 (Bish.); *Forbes* 77–*M*, Wainee Gulch, West Maui, May,

---

[1] Degener states on his label: "Plants ordinarily dioecious but in several cases flower clusters on a pistillate tree on a single branch were all staminate and vice versa. Sexes, however, seem not to be mixed in same cluster. Anthers blue, aging to white."

1910 (Berl.; Bish.; Field; Gray); *Forbes* 808–*K*, Waimea Drainage Basin, west side, Kauai, July 3–August 18, 1917 (Berl.; Bish.; Field; Gray); *Forbes* 835–*K*, same locality and date (Bish.; Field); *Forbes* 1,035–*K*, near Kalalau Pali, Kauai, July 3–August 18, 1917 (Bish.); Forbes 1,286–*O*, Kahauiki Valley, Oahu, April 13, 1909 (Berl.; Bish.; Field); *Forbes* 1,823–*O*, Mokuleia, slopes of Puu Kaala, Oahu, April 26–May 16, 1912 (Bish.; Field; Gray); *Forbes* 2,253–*M*, lateral ridge, right-hand side of Olowalu Valley, Maui, May 7, 1920 (Bish.; Field); *D. Wesley Garber & Charles N. Forbes* 178 and 179, right fork of Wailupe Valley, Oahu, January 12, 1920 (Bish.); *Edward Y. Hosaka* 144 (type, Bish.); *Hosaka* 832, tree 15 feet tall, in moist, open gully, 2nd north fork, Kipapa Gulch, Waipio, Koolau Mountains, Oahu, November 13, 1932 (Berl.; Bish.; Field; Gray; Kew); *E. P. Hume* 460, tree, alt. 2,200 feet, on dry, wooded slope, Schofield Trail to Kaala, Oahu, April 3, 1932 (Field); *Rev. J. M. Lydgate*, Molokai (Berl.); *George C. Munro*, Kaiholena, Lanai, September 16, 1913 (Field); *Munro* 100–*L*, same locality and date (Bish.; Field); *Munro* 459, same locality, July 27, 1915 (Bish.); *K. Nitta* 7, alt. 2,000 feet, Puu Kaala, Oahu, October 13, 1929 (Deg.); *Jules Remy* 605, Maui, 1851–1855 (Par.); *Remy* (similarly) 605, Lanai, 1851–1855 (Par.); *Remy* 606, Hawaii, 1851–1855 (Field; Par., 2 sheets; approaching var. *glabrescens*); *Joseph F. Rock* 717, Hawaiian Isls. (Field); *Rock* 8,103, Mahana Valley, Lanai, August 2, 1910 (Berl.; Bish.; Field; Gray); *Olof H. Selling* 3,585, Waianae, Kaala, Oahu, September 25, 1938 (Goth.); *Carl Skottsberg* 991, in forests near Kokee Ranger Station, Kauai, October 28, 1922 (Bish.; Goth.); *Harold St. John* 10,416, small tree, 15 feet tall, alt. 2,700 feet, east ridge, Puu Hapapa, Waianae Mountains, Honouliuli, Oahu, March 16, 1930 (Bish.; Field; Gray); *St. John & Francis R. Fosberg* 13,762, trees 20 feet tall, trunk diameter 6 inches, alt. 2,500–3,300 feet, moist woods, Milolii Ridge, Waimea, Kauai, December 27, 1933 (Berl.; Bish.; Field; Gray; Kew); *St. John, Hosaka, Hume, and others* 10,820, same locality and date (Bish.; Field; Gray); *Amy Suehiro*, alt. 2,400 feet, Puu Kaala, Oahu, January 8, 1933 (Bish.); *T. Yoshioka*, alt. 2,200 feet, in woods on slopes of Puu Kaala, Waianaeuka, Oahu, November, 1933 (Bish.).

The var. *magnifolium* is the form commonly taken heretofore as representing *C. sandwicense* proper. The latter, however, has smaller leaves (the blade 7–10 rarely –13 cm. long and 2–3 rarely –5.5 cm. wide) and is known only from the southwestern corner of East Maui.

Claoxylon sandwicense var. γ **Hillebrandii** Sherff, Amer. Journ. Bot. 24: 89. 1937.

Leaves when dry often bluish-green. Flowers (at least the staminate ones) commonly 7–15-aggregated, more often sessile or subsessile (usually only 1–3 with pedicels), often intermixed with calloused areolae (these whitish, rounded, centrally depressed, 0.3–0.8 mm. wide); calyx lobes under 4 mm. long.

Type specimen: Collected by *William Hillebrand,* no. 175, Kohala Range, northwestern Hawaii (Bish.).

Distribution: Northwestern Hawaii.

Specimens examined: *Charles N. Forbes* 16–*H*, Puuwaawaa, June 8–14, 1911 (Berl.; Bish.; Field; Gray); *Hillebrand* 175 (type, Bish.); *Joseph F. Rock* 3,933, Puuwaawaa, June 15, 1909 (Bish.; Field); *Rock* 10,095, same locality, March, 1912 (Bish.); *Carl Skottsberg* 683, same locality, September 26, 1922 (Bish.; Goth.).

Hillebrand's plant had been labeled (I know not by whom), "*Claoxylon sandwicense* Müll. var." The essential characters of the inflorescence are found on examination of the specimens subsequently collected by *Forbes,* by *Rock,* and by *Skottsberg,* to have persisted constantly for more than half a century. Rock (Indig. Trees Haw. Isls. 255. 1913) noted the peculiarities of the plants from the type locality in the following words: "The plants from the latter locality [i.e., lava fields of Puuwaawaa] differ somewhat from those of other localities in that their leaves turn to a steel-blue color on drying, and some other minor points."

Claoxylon sandwicense var. δ **tomentosum** Hillebr. Fl. Haw. Isls. 399. 1888.

Leaves as in var. *magnifolium* but more hispid on lower surface (which is truly tomentose only when young, being moderately appressed-hispid at maturity); inflorescence said to be sometimes paniculate.

Type specimen: Collected by *Valdemar Knudsen,* Kauai (Berl.).

Distribution: Kauai.

Specimens examined: *A. Brodie* 4,035, Kauai (Bish.); *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2,852*b*, along Kalalau Trail, Kokee region, August 20, 1938 (Goth.); *Otto Degener* 8,003 *pro parte,* in forest, along Kalalau Trail near Kokee, July 4, 1926 (Field; Kew; *cum var. magnifolio commixt.*); *Charles N. Forbes* 442–*K*, Kaholuamanu behind Waimea, September, 1909 (Bish.; Field; Gray); *Rev. J. M. Lydgate,* Olokele Valley (Bish.); *Lydgate* 7, same locality

(Bish.); *Horace Mann & William T. Brigham* 586, alt. 2,000–3,000 feet, Waimea, 1864–1865 (Bish.; Corn.; Field); *Joseph F. Rock* 1,807, Hawaiian Isls. (Bish.); *Rock* 2,075, Halemanu, February 14–26, 1909 (Bish.); *Rock* 5,595, alt. 3,700 feet, along trail and water-courses leading to Waialae Stream, September, 1909 (Bish.; Field; Gray); *Rock* 12,937, Kaholuamanu, October, 1916 (Bish.).

Wawra (Flora 58: 148. 1875) described *Claoxylon sandwicense*, for which he understood his own no. 2,078 (later named var. *tomentosum* by Hillebrand), as dioecious. Several of the specimens examined, however, are monoecious (as in the species proper) and it may well be that Wawra had unrepresentative specimens before him.

Heller (Minnesota Bot. Studs. 1: 843. 1897) incorrectly took his own no. 2,878 (from the edge of the plateau above Waimea, Kauai) as representing Hillebrand's var. *tomentosum.* He raised var. *tomentosum* to specific rank. Botanists since have quite generally accepted Heller's change. Heller's 2,878, however, is unlike the various other specimens which botanists have labeled, no doubt correctly, *tomentosum.* It has the fully expanded leaves densely and shortly silken-tomentulose underneath, the arcuate setulae forming a yellowish-brown coating particularly velvety to the touch. I have named it *C. Helleri* (p. 549). In var. *tomentosum* the fully grown leaves are moderately to subsparsely appressed-hispid beneath, the longer and usually straighter hairs being more whitish and giving a hispid rather than tomentose appearance to the lower surfaces of the leaves (*cf. Wawram loc. cit.:* "fol. novella tomentosa vetustiora glabrata").

Claoxylon sandwicense var. ε **glabrescens** (Sherff) comb. nov.; *Claoxylon sandwicense* var. *magnifolium* f. *glabrescens* Sherff, Amer. Journ. Bot. 24: 89. 1937.

Similar to var. *magnifolium* but with leaves more frequently membranaceous or papery-thin, more frequently bluish-purple when dry, and with rachis and pedicels of inflorescence becoming glabrous or at least glabrate.

Type specimen: Collected by *Harold St. John,* no. 17618, shrub 4 feet tall, alt. 2,200 feet, on wooded slope, Puu Kawiwi-Puu Kaala Ridge, Makaha, Oahu, March 31, 1935 (Bish.).

Distribution: Oahu, Lanai, and Hawaii.

Specimens examined: *Anonymous* (probably *Adelbert Von Chamisso* on Oahu; Field); *Chamisso, see Von Chamisso; Erling Christophersen* 3,699, tree, alt. 520 meters, in forest grove at head of valley

5, below Kanehoa, central Lualualei, Waianae Mountains, Oahu, June 15, 1932 (Berl.; Bish.; Field; Gray); *Otto Degener* 7,995, in open woods, third small valley northeast of Palikea, Oahu, September 19, 1932 (Berl.; Brit.; Deg.; Del.; Field, 2 sheets; Gray; Kew; Mo.; Mun.; Mus. V.; N. Y.; Petrop.; Phila.; U. S.; U. V.); *Degener* 7,996; in open thicket, west side of Pohakea Pass, Oahu, July 30, 1932 (Berl.; Brit.; Deg.; Del.; Field; Mun.; Mus. V.); *Degener, Kwan Park, & Yoshimasa Nitta* 7,998, near summit of Piko Trail, Makua Valley, Oahu, July 10, 1932 (Deg.; Field); *Charles N. Forbes*, Oahu, April 13, 1909 (Bish.); *Forbes* 13-*L*, Kaiholena Valley, Lanai, June, 1913 (Berl.; Bish.; Field; Gray; Kew; N. Y.; U. S.); *Forbes* 1,807-*O*, Mokuleia, slopes of Puu Kaala, Oahu, April 26–May 16, 1912 (Bish.; Field); *William Hillebrand*, Puu Kaala, Oahu (Berl.); *Hillebrand*, Nuuanu, Oahu (Berl.); *Hillebrand*, Lanai, July, 1870 (Berl.); *Hillebrand & Rev. J. M. Lydgate*, Hilo, Hawaii, April, 1871 (Bish.); *Edward Y. Hosaka & Otto Degener* 1,942, tree 20 feet tall, rare, on wooded, semi-moist gully, Keaau-Makua Forest Reserve, Makua, Waianae Mountains, January 13, 1938 (Bish.; Del.; Field); *Edward P. Hume* 527, alt. 2,200 feet, on steep, dry, wooded ridge, Makaha Valley, Waianae Range, Oahu, April 3, 1932 (Bish.); *George C. Munro* 20, Lanai (Bish.); *Munro* 256, Lanai (Bish.); *Harold St. John* 10,361, tree 20 feet tall, alt. 1,700 feet, on stream bank, north fork of valley east of Palikea, Waianae Mountains, Honouliuli, Oahu, February 23, 1930 (Berl.; Bish.; Del.; Field; Par.); *St. John* 11,608, small tree 15 feet tall, alt. 1,700 feet, on wooded bank above stream, Makaha Valley, Waianae Mountains, April 3, 1932 (Berl.; Bish.; Field); *St. John* 12,929, shrub 5 feet tall, alt. 2,000 feet, in wooded gulch, Puu Kaala, Waianaeuka, Oahu, January 8, 1933 (Bish.; Field); *St. John* 17,618 (type, Bish.: cotypes, Field; Gray); *St. John & Francis R. Fosberg* 12,128, tree 20 feet tall, alt. 1,300 feet, in moist woods, 2nd gulch east of Puu Kaupakuhale, northeast slope of Puu Kaala, Mokuleia, Oahu, October 23, 1932 (Bishop; Field); *Adelbert Von Chamisso* 65′, Oahu, 1817 (Berl.).

Claoxylon sandwicense var. ζ **Degeneri**, var. nov.

Varietati *magnifolio* similis sed differt: foliorum laminis late oblongis etiam subrotundatis, apice nunc rotundis nunc subtruncato-emarginatis, basi latissime cuneatis vel truncatis, principalium 6–9 cm. longis et 5–7.5 cm. latis.

Similar to var. *magnifolium* but differing in its leaf-blades; these broadly oblong or even subrotundate, at apex now rotund now subtruncate-emarginate, at base very broadly cuneate or truncate, principal ones 6–9 cm. long and 5–7.5 cm. wide.

Type specimen: Collected by *Otto Degener*, no. 8,004, in Waimea Canyon near Kokee, Kauai, June 30, 1926 (Field).

Distribution: Northwestern Kauai.

Specimens examined: *Degener* 8,004 (type, Field: cotype, Berl.); *Harold St. John, Edward Y. Hosaka, Edward P. Hume, et alii* 10,814, alt. 3,500 feet, Nualolo Trail, Na Pali-Kona Forest Reserve, December 28, 1930 (Berl.; Bish.; Field; Gray; Kew).

This interesting variety is named after the collector of its type material, Mr. Otto Degener, to whom I am indebted for the encouragement originally to study the genus *Claoxylon* and for his whole-hearted co-operation in assembling additional herbarium specimens for my study. *Rock* 5,593 and *St. John, Hosaka, Hume, et alii* 10,820*bis* (both collections at present inaccessible to me) were formerly suspected of being hybrids, the first between *C. Helleri* and *C. sandwicense* var. *tomentosum*, the second between *C. Helleri* and *C. sandwicense* var. *magnifolium*.[1] They both doubtless belong here. Rock's plants were collected on outskirts of forest below Kaholuamanu, Kauai, September, 1909 (Bish.; Field). The plants by St. John, Hosaka, Hume, and others came from woods, alt. 2,000–3,750 feet, Nualolo Trail, Na Pali-Kona Forest Reserve, Kauai, December 28, 1930 (Bish.; Field).

3. **Claoxylon Remyi** sp. nov.; *Claoxylon insigne* H. Baill. *ex* Drake del Castillo, Illustr. Fl. Insul. Mar. Pacif. 291. 1892 (nomen subnudum).

Ligneum, probabiliter arborescens, cortice griseo. Folia maxima, ramuli apicem versus conferta, opposita, suberecta, parce petiolata petiolo brevi (sub 1 cm. longo) conduplicato hispidulo marginato crassoque; lamina obovato-spathulata, apice obtusa, sub medio usque ad basim sensim angustata, margine integra vel obsoletissime minutissimeque denticulata, supra glabrata, infra hispidula, sicca utrinque minutissime numerosissimeque punctulata, ±3 dm. longa et ±1.1 dm. lata. Flores (forsitan monoici, unicus ad anthesin et 3 capsulae pro typo visae) solitarii in axillis, pedicellati pedicello dense minuteque hispido 2–4-nodoso (nodis cum bracteis oppositis ovatis 1–2 mm. longis) demum ±2.5 cm. longo. Calyx 4-partitus; sepalis ovato-rotundis, membranaceis, margine eroso-crenulatis et

---

[1] In my former treatment of this apparent hybrid (Amer. Journ. Bot. 24: 88. 1937), the words "var. *magnifolium*" were omitted through oversight.

subhyalinis, utrinque densissime pubescentibus, 4–9 mm. longis. Capsula distincte 4-partita et 4-loculata, circ. 2.5 cm. lata et 1.2–1.6 cm. alta, minutissime pubescens, coccis dorsaliter rotundatis et vix carinatis.

Ligneous, probably arborescent, with grayish bark. Leaves very large, clustered toward tip of branchlet, opposite, suberect, scarcely petiolate; petiole short (under 1 cm. long), conduplicate, hispidulous, marginate, thick; blade obovate-spatulate, at apex obtuse, gradually narrowed from below middle all way to base, marginally entire or very obsoletely and very minutely denticulate, glabrate above, hispidulous below, in dry state very minutely and very numerously punctulate on both surfaces, ±3 dm. long and ±1.1 dm. wide. Flowers (perhaps monoecious, a single one at anthesis and three at fruiting stage seen on type) solitary in axils, pedicellate; pedicel densely and minutely hispid, 2–4-nodose (nodes subtended with bracts, these opposite, ovate, and 1–2 mm. long), finally ±2.5 cm. long. Calyx 4-parted; sepals ovate-rotund, membranaceous, marginally erose-crenulate and subhyaline, on both surfaces very densely pubescent, 4–9 mm. long. Capsule distinctly 4-parted and 4-loculate, about 2.5 cm. wide and 1.2–1.6 cm. tall, very minutely pubescent, the cocci dorsally rounded and scarcely carinate.

Type specimen: Collected by *Jules Remy*, no. 604, on Island of Hawaii, 1851–1855 (Par.).

Distribution: Known only from Hawaii.

Specimens examined: *Remy* 604 (type, Par.).

A NEW SPECIES OF ALEURITES FORST.

Aleurites Remyi sp. nov.

Arbor, ramis ignotis. Folia longipetiolata petiolis teretibus irregulariter subalato-striatis breviter stellato-pubescentibus usque ad 2.5 dm. longis; lamina membranacea, irregulariter saepius 5-lobata, 1–2 dm. longa, inter sinus inferiores laterales 5–10 cm. lata, e basi truncata palmatim 5-venosa venis pennivenulosis et infra elatis, supra minute stellato-pubescenti, infra sparsissime vel secundum venas interdum moderate sed semper minute stellato-pubescenti; lobis basalibus recte divaricatis, subulato-linearibus, 1–4.5 cm. longis, apice paulum antroversis retroversisve; medianis lineari-lanceolatis, antroversis, 1.5–7 cm. longis; terminali ovato- vel lanceolato-oblongo, apice acuminato, utroque latere interdum obscure sinuoso vel obscurissime 1–4-lobulato, usque ad 1.3 dm. longo basi

extrema 6–8 cm. lato. Flores feminei ignoti; masculini forsitan iis *A. moluccanae* similes.

Tree, branches unknown. Leaves long-petioled; petiole terete, irregularly subalate-striate, shortly stellate-pubescent, up to 2.5 dm. long; blade membranaceous, irregularly more often 5-lobed, 1–2 dm. long, 5–10 cm. wide between the lower lateral sinuses, truncate at base, palmately 5-veined (the principal veins salient beneath and pinnately branched), minutely stellate-pubescent above, very sparsely or along the veins sometimes moderately but always minutely stellate-pubescent beneath; basal lobes straight-divaricate, subulate-linear, 1–4.5 cm. long, their tip bent slightly forward or backward; median lobes linear-lanceolate, directed forward, 1.5–7 cm. long; terminal lobe ovate- or lanceolate-oblong, at apex acuminate, on each side at times obscurely sinuous or very obscurely 1–4-lobulate, up to 1.3 dm. long, at extreme base (i.e., from base to base of subtending sinuses) 6–8 cm. wide. Pistillate flowers unknown; staminate flowers perhaps similar to those of *A. moluccana.*

Specimens examined: *Jules Remy* 600 *pro parte,* Hawaiian Isls., 1851–1855 (3 type sheets, Par.).

Remy collected considerable material of *Aleurites* in the Hawaiian Islands nearly a century ago, and this all was put under his number 600 in the Museum of Natural History at Paris. Most of the specimens are of the well known and widely distributed *A. moluccana* (L.) Willd. There are three sheets of mounted and several folders of unmounted material, however, which differ at once in the foliage and may be taken as typifying a new species. *A. moluccana* itself has long been noted for its variations in foliar size and outline. Some of its leaves are simple and some are variously 2–7-lobed; only a few are basally truncate, most of them being rounded or cordate; the lobes when present are normally short and broad or triangular, and particularly the terminal lobe is more or less deltoid, being about as broad at the extreme base as long (the only exception so far observed being a highly anomalous specimen collected by a Mr. Podmore above Kailua, on road to Holualoa, North Kona, Hawaii, in 1932, and deposited in Bishop Museum). *A. Remyi* differs conspicuously in its slender, elongate lateral lobes and its more or less oblong terminal lobe. Since *A. moluccana* is a species of very wide distribution (tropical Polynesia, a great part of Malaysia and the Philippine Islands, etc.) and never anywhere outside the Hawaiian Islands has been observed to produce leaves of this peculiar shape, and since the Hawaiian Islands are known definitely to abound in endemic forms, there seems no doubt that Remy collected an undescribed, endemic species. I have searched through much material lent me from the Berlin Botanical Garden, the Museum of Natural History of Paris, the Bernice P. Bishop Museum of Honolulu, the large private herbarium of Mr. Otto Degener in Honolulu, the herbarium of Cornell University, and elsewhere, hoping to find that this strange species had been collected again since Remy's day, but in vain. Hillebrand (Fl. Haw. Isls. 400. 1888) gave only *A. moluccana,* as did Rock later, in his Indigenous Trees of the Hawaiian Islands (p. 255. 1913).

The first and second type sheets at Paris have small, detached portions of staminate inflorescence separately mounted. These are entirely typical for *A. moluccana,* but in view of Remy's having collected much *A. moluccana* material at the time and confused the two kinds under the same collection number 600, no reliance can be placed upon the floral characters thus displayed.

NOTES ON DRYPETES VAHL

Drypetes Forbesii sp. nov.

Arbor sine dubio dioica; unico ramulo viso griseo conferte lenticellato, internodiis 1–2.5 cm. longis, cortice sicco longitudinaliter ruguloso aliter glabro. Folia alterna, glaberrima; petiolo moderate gracili, circ. 9–12 mm. longo, recto vel aegre arcuato; lamina ovata vel interdum obovata, subcoriacea, apice obtusa vel vix acuminata, basi latissime cuneata vel fere subrotundata, 7–9 cm. longa et 4.2–5.8 cm. lata, penninervia nervis lateralibus principalibus circ. 6 jugis, infra pulcherrime reticulato-nervulosa, marginibus aegre serrata dentibus 7–13 pro utroque latere ±3–8 mm. longis sed sub 1 mm. altis. Stipulae (non visae) probabiliter caducae. Flores ignotae. Fructus normaliter in racemis axillaribus simplicibus vel rarius basim versus fasciculate 2- vel 3-ramosis 3–5-congregati, pedicello glabro, saepius recto, circ. 6–7 mm. longo; sepalis 4, ovatis, integris sed marginibus et faciebus (praesertim interiori) plus minusve hirsutis, demum patenti-recurvatis, circ. 2 mm. longis; staminibus rudimentariis brevissimis, siccis atris, antheris oblongis; disco 4-lobato lobis episepalis, deltoideo-ovatis, membranaceis, plus minusve serrulatis, ad fructus adstricto-adpressis, plerumque 1–2.5 mm. longis; ovario submaturo subobovato-globoso (itaque tereti vel subtereti), sicco atro, glabro, 8–11 mm. alto; stylo brevissimo (circ. 0.5 mm.), crasso; stigmate bifido, lobis reniformibus.

Tree, doubtless dioecious; a single branchlet seen, this gray and thickly lenticellate, internodes 1–2.5 cm. long, bark when dry lengthwise wrinkled but otherwise glabrous. Leaves alternate, very glabrous; petiole moderately slender, about 9–12 mm. long, straight or slightly curved; blade ovate or at times obovate, subcoriaceous, apically obtuse or barely acuminate, basally very broadly cuneate or almost subrotundate, 7–9 cm. long and 4.2–5.8 cm. wide, penninerved with about 6 pairs of principal lateral nerves, very beautifully reticulate-nervulose beneath, each edge weakly serrate with 7–13 teeth, these ±3–8 mm. long but under 1 mm. tall. Stipules (not seen) probably caducous. Florets unknown. Fruits normally in axillary and simple or more rarely toward base fasciculately 2- or 3-branched racemes, the glabrous pedicel about 6–7 mm. long and more often straight; sepals 4, ovate, entire but marginally and facially (especially on inner face) more or less hirsute, finally spreading-recurved, about 2 mm. long; stamens rudimentary, very short, black when dry, their anthers oblong; disc 4-lobed; lobes episepalous, deltoid-ovate, membranaceous, more or less serrulate, tightly appressed to the fruit, commonly 1–2.5 mm. long; ovary submature, subobovate-globose (thus terete or subterete), black when dry, glabrous, 8–11 mm. tall; style very short (about 0.5 mm.), thick; stigma bifid, its lobes reniform.

Specimens examined: *Charles Noyes Forbes* 1,008–*O*, Konahuanui Ridge, Oahu, January 6, 1909 (type, Bish.).

Forbes had mistaken his plant for *Antidesma platyphyllum* Mann, which it resembled in foliage except for its narrower and longer petioles, but from which it differed at once *in not having the fruits strongly compressed and numerous on very short (1–4 mm.) pedicels in delicate racemose subdivisions of a lax panicle 4–10 cm. long.* Forbes' plant would belong in the Old World genus *Cyclostemon* Blume, now merged by Hutchinson (*in* Thistleton-Dyer, Fl. Trop. Afr. 6^1: 674. 1912) and by F. Pax and K. Hoffmann (*in* Pax *in* Engler, Pflanzenreich IV. 147. xv. 237 et seq. 1922) and by F. Pax (op. cit. 229) with the New World *Drypetes* Vahl.

I have seen no staminate material. The species is undoubtedly very rare and perhaps on the road to extinction. A search should be made for additional material in the type locality to permit of amplifying the description and of determining the subgeneric affinities more precisely. Particularly will a study of the seed development and structure be advisable to note the presence or absence of an aril (vide infra).

J. F. Rock (Indig. Trees Haw. Isls. 243. 1913) described a related species from the Island of Hawaii, erecting for it a new genus, *Neo-*

wawraea, and designating it *N. Phyllanthoides*. His species has the leaves mostly thinner and larger, perfectly or essentially entire, and at base mostly cordate or subcordate. He describes the fruit as a globose berry "with persistent calyx." In *Drypetes Forbesii* the submature fruits have the disc-lobes closely adhering to the base, simulating a persistent calyx, but the real calyx, which is separated from the disc by a circle of rudimentary stamens, spreads out and has its four lobes more or less recurved. The effect in this case is to make the ovary seem, though falsely so, as if shortly and thickly stipitate. Wawra described the seeds of *Neowawraea* as being enclosed in an arillus. I have not been able to confirm or disprove this statement, the specimens of Wawra's species examined by me all having lacked good fruits. Unfortunately, Wawra seems to have overlooked *Cyclostemon* and *Drypetes* in classifying his new species, for he contrasted it only with the very different genera *Phyllanthus* and *Bischofia*. Likewise unfortunately, Pax (loc. cit.) overlooked Rock's proposed genus *Neowawraea* when monographing *Drypetes*. Thus the genus *Neowawraea* with its one species *Phyllanthoides* could not fairly be said to represent either Rock's or Pax's best judgment as to its validity. There appears, however, no warrant for longer maintaining *Neowawraea*. It is therefore referred here to *Drypetes* Vahl and its one described species renamed:

Drypetes Phyllanthoides (Rock) comb. nov.; *Neowawraea Phyllanthoides* Rock, loc. cit.

Specimens examined: *Erling Christophersen* 3,654, alt. ±600 meters, tree in open forest on valley side, Makua Valley, Oahu, April 20, 1932 (Bish.); *Otto Degener* 9,099, giant dying tree in forest, Kamokuiki Valley (between Puuiki and Puu Kamaohanui, Oahu, April 12, 1933 (Deg.); *Degener, Bush, Potter, Ordoñez, & Foster* 12,341, single dying, hollow tree in forest, Honouliuli Trail on southeast slope of Puu Hapapa, Oahu, May 21, 1939 (Berl.; Deg.; Del.; Field); *Degener & Charles Sheldon Judd* 11,010, huge tree with trunk 12 feet in circumference and in general resembling an old chestnut tree, almost extinct, on open, forested, valley side, southeast corner of Makua Valley, Oahu, September 27, 1932 (Berl.; Deg.; Field; Par.); *C. S. Judd*, alt. 1,200 feet, 250 yards below trail, near Milolii, Paaiki Valley, Kauai, July, 1932 (Bish.; referred by Judd to *Drypetes*); *H. K. Keppeler*, 100 feet oceanward of Government Road and about 1 mile south of Okoe boundary, Kapua, South Kona, Hawaii, "3 trees seen, all dying," December, 1932 (Bish.); *Noel H. Krauss*, alt. 800–1,000 feet, Piko trail, Kahanahaiki Valley, Waianae Mts., Oahu, December 30, 1933 (Field); *Alfred Meebold* (*Otto Degener* distrib. no.) 9,097, "only one tree which was found by Rock—this is dying," along Kau Road within 2–3 miles of new tourist rest-house on left-hand side 40 yards from road, Hawaii, May, 1932 (Deg.); *Harold St. John* 13,157, growing 20 feet tall with trunk 8 feet in diameter, top and center dead, part of main trunk and sprouts alive, alt. 1,800 feet, steep gulch, Pohakea Pass, Waianae Mts., Honouliuli Forest Reserve, Oahu, May 12, 1933 (Field); *St. John, E. Y. Hashimoto, E. Y. Hosaka, J. C. Lindsay, & D. D. Mitchell* 11,354, type tree, half dead, 25 feet tall, trunk diameter 2.5 feet, alt. 2,000 feet, Kapua on *aa*, South Kona, Hawaii, December 27, 1931 (Bish.).[1]

NOTES ON PHYLLANTHUS L.

Phyllanthus sandwicensis Muell. Arg. Linnaea 32: 31. *Circa* 1862; DC. Prodr. 15": 389. 1862; *Phyllanthus distichus* Hook. & Arn. Bot. Beechey's Voy. 95. 1832 (*non P. distichus* [L.] Muell. Arg.); *Phyllanthus sandwicensis* var. *oblongifolius* Muell. Arg. locis cit.; *Phyllanthus sandwicensis* f. *grandifolia* Wawra, Flora 58: 149. 1875.

Specimens examined: *George Barclay*, Oahu, 1837 (Par.); *Frederick Debell Bennett*, Oahu, 1833–1836 (Berl.; native name, *ahti*); *William Allanson Bryan* 653, Pacific Heights, Oahu, December 20, 1903 (Bish.); *William Bush* (*Otto Degener* distrib. no.) 8,013, Helemanu (Helemano) Ridge, Oahu, June 23, 1929 (Deg., 2 sheets); *Adelbert Chamisso*, see *Von Chamisso; Erling Christophersen, Gerrit Parmile Wilder, & Edward Hume* 1,516, in forest, alt. 450–600 meters, Kuliouou, Oahu, February 5, 1931 (Bish.); *Christophersen, Wilder, & Hume* 1,523, same locality and date (Berl.; Bish.; Del.; Field; Gray; Par.); *Otto Degener* 2,464, Kuliouou Valley, near head of, on rocks, Oahu, December 11, 1927 (Deg.); *Degener* 4,145, in moderately dry forest, up Paumalu Ridge, Waialee, Oahu, October 18, 1931 (Deg., 2 sheets); *Degener* 8,015, on steep, rainy ridge, Waianae Valley up toward Mt. Kaala, Oahu, April 24, 1932 (Deg.); *Degener* 8,022, in rainy woods, along Manoa Cliff Trail, Oahu, February 6, 1927

---

[1] Mr. Degener mentioned (in herb.) that this species occurred also upon Molokai. He recently wrote Mr. Charles Sheldon Judd, Territorial Forester of the Hawaiian Islands, relative to the Molokai habitat and Mr. Judd replied (under date of May 16, 1939): "The *Neowawraea* which Russ found on Molokai was only a small tree. The last time he was up there he returned from Molokai and told me that the tree had died.....There is a good specimen on Kauai, however, which I think you should add to your collection. It is in the region where the Kauai red cotton trees grow and I saw it there about three years ago. About the only person who knows how to locate it is Mr. Albert W. Duvel. It is in the region near Nualolo near the edge of the steep cliffs." It will be observed that the specimen already cited above as having been collected by Judd near Milolii, Paiiki Valley, came from "the region near Nualolo" and perhaps from the same tree.

(Deg.); *Degener* 8,023, usually 1.5–2 feet tall but where overshadowed growing to 4 or even 5 feet, Hauula, Oahu, November 13, 1927 (Deg.); *Degener* 8,024, on dry mountain near Waihee, West Maui, July 2, 1927 (Deg.); *Degener* 8,025, Oahu, February 20, 1927 (Deg.); *Degener* 8,027, near Oopuola Stream, East Maui, July 7, 1927 (Deg.); *Degener* 8,029, northeast of Nuuanu Valley, Oahu, November 20, 1926 (Deg.); *Degener & Emilio Ordoñez* 12,185, on dryish, forested slope, Kaaawa Gulch (mouth of Kaala), Oahu, August 2, 1938 (Berl.; Deg.; Field); *Degener, K. Park, Y. Nitta, O. Swezey, & D. L. Topping* 8,014, in forest, middle ridge of Niu Valley, Oahu, June 4, 1932 (Corn.; Deg., 2 sheets); *Frank E. Egler* 37-201, alt. 320 meters, in opening in forest, koa zone, at branch in stream, west Niu gulch, Oahu, July 20, 1937 (Bish.); *Abbé Urbain Faurie* 485, Koloa, Kauai, December, 1909 (Par.); *Faurie* 489, Kaala, Hawaii, November, 1909 (Del., 2 sheets; Par.); *Charles N. Forbes*, Waiolani Ridge, Oahu, December 10, 1908 (Berl.; Bish.; Field); *Forbes*, Mokuleia, slopes of Kaala, Oahu, April 26–May 16, 1912 (Berl.; Bish.; Field); *Forbes* 1,669–*O*, Puu-O-Kona, Oahu, March 14, 1911 (Bish.; Field); *Forbes* 2,021–*O*, ridge east of Kouliououiki, Oahu, November 17, 1914 (Bish.; Field); *Forbes* 2,372–*M*, upper part of Olowalu Valley, Maui, May 14, 1920 (Berl.; Bish.; Field); *Francis Raymond Fosberg* 12,358, growing 5 dm. tall, alt. 400 meters, on dry, brushy ridge, south side of Makua Valley, Waianae Mts., Oahu, November 17, 1935 (Bish.; Field); *D. Wesley Garber* 423, Manoa Cliff Trail, Oahu, June 13, 1920 (Bish., 2 sheets); *Gaudichaud*, Hawaiian Isls. (Par.); *Gaudichaud* 288, Hawaiian Islands, September and October, 1836 (Par., doubtless type material); *A. A. Heller* 2,196, on the ridge west of the Hanapepe River, Kauai, August 6, 1895 (Corn.; Par.); *William Hillebrand*, Waianae, Oahu (Berl.); *Hillebrand*, Niu, Oahu (Berl.); *Albert S. Hitchcock* 15,225, alt. 1,400 feet, Olokele Gulch, Kauai, October 18, 1916 (U. S.); *Edward P. Hume*, alt. 600 meters, north ridge, Kaaawa, Oahu, April 12, 1931 (Bish.); *Hume* 389, alt. 2,100 feet, open ridge, Puu Hapapa, Waianae Mts., Oahu, December 1, 1931 (Bish.); *Horace Mann & William T. Brigham*, Hawaiian Islands (Bish.); *Mann & Brigham* 104, Oahu (Bish.; Corn., 2 sheets); *Mann & Brigham* 435 and 436, Hawaiian Isls. (Bish.); *H. Ochiae* (*Otto Degener* distrib. no.) 8,031, Oahu, November 20, 1926 (Deg.); *Olaf Oswald & Gertrude E. Douglas* 466, alt. about 2,000 feet, Middle Ridge Trail, Niu, Oahu, July 29, 1928 (Corn.); *Jules Remy* 601, Maui, 1851–1855 (Berl.; Field); *Joseph F. Rock* 4,811, Niu Valley, Oahu, August 22, 1909 (Bish.); *Billie Seamster* (*Otto Degener* distrib. no.) 8,035, trail near hair-pin turn, Nuuanu Pali, Oahu, November 20, 1926 (Deg.); *Carl Skottsberg* 302, Palehua, Waianae Mts., Oahu, August 23, 1922 (Bish.); *Skottsberg* 398, Makaleha Valley, Waianae, Oahu, August 30, 1922 (Bish.); *D. LeRoy Topping* 2,748, Niu Ridge, Oahu, September 7, 1924 (Deg.); *Topping* 3,039, Makaleha Valley, Oahu, February 22, 1925 (Deg.); *Adelbert Von Chamisso* 192, Oahu (Berl.; labeled by Mueller-Argau for his var. *oblongifolius*).

Mueller (loc. cit.) described his *Phyllanthus sandwicensis* rather generally and followed it with a detailed description of four proposed varieties: α *oblongifolius*, β *ellipticus*, γ *parvifolius*, and δ *radicans*. Unlike most authors, Mueller frequently used the *alpha* position for a variety different from the species proper and the *beta* position for the var. *genuina*. In the present case, however, he described no var. *genuina* and his *alpha* var. *oblongifolius* may be taken as typifying the species proper. Indeed, in his treatment for De Candolle's Prodromus, Mueller cited *P. distichus* Hook. & Arn. (*nec alior.*) as synonymous with his own *P. sandwicensis* proper, and *P. distichus* Hook. & Arn. as identical with the var. *oblongifolius* Muell. Arg. Doubtless because of these facts, Hillebrand (Fl. Haw. Isls. 401. 1888) retained essentially the description of α *oblongifolius* for *P. sandwicensis* proper and excluded Mueller's other three varieties, placing them all under one unnamed var. β. I have recently examined (and again have before me) a number of original specimens collected by Gaudichaud and by Chamisso, and specimens principally cited by Mueller for his varieties. From these it becomes evident, in the light of numerous additional specimens collected since Mueller's time, that Hillebrand's judgment, as far as Mueller's four varieties were concerned, was sound. Hillebrand, as already implied however, did not exercise his right to choose from among Mueller's varietal names one to be retained. Since I can find in literature no formal treatment of this matter made by anyone else and a choice of names must be made in accordance with the present-day International Rules, I here choose Mueller's var. β *ellipticus* to stand for Hillebrand's var. β exclusive of material from the Islands of Molokai and Lanai, and thus to include Mueller's vars. β, γ, and δ (also *P. sandwicensis* f. *parvifolius* Wawra, Flora 58: 149. 1875).

Specimens of *Phyllanthus sandwicensis* var. *ellipticus* examined: *Anon.* (*Otto Degener* distrib. no.) 8,034, trail near hair-pin turn, Nuuanu Pali, Oahu, November 20, 1926 (Deg.); *Adelbert Chamisso*, see *Von Chamisso; Erling Christophersen* 1,272, alt. 400–500 meters, Kalihi Pali, Oahu, March 11, 1930 (Bish.; Field); *Christophersen*, *Wilder, & Hume* 1,503, in open forest, alt. 3–500 meters, head of Kalihi Valley, Oahu, January 25, 1931 (Berl.; Bish.; Field; Del.); *Otto Degener* 8,028, rocky ridge northeast of Kipu, Kauai, June 17, 1926 (Deg.); *Degener, Salucop, & Arlantico* 11,645, in decadent forest, alt. 1,500 feet, Kawaihapai, Oahu, January 1, 1938 (Berl.; Deg.; Field; etc.); *Degener & C. L. Shear* 8,026, on Konahuanui and Honolulu side of Nuuanu Pali, Oahu, February 6, 1928 (Corn.; Deg., 2 sheets); *F. Didrichsen* 3,535, Oahu, 1845–1847 (Bish.); *Abbé Urbain Faurie* 462, Kalihi Pali, Oahu, October, 1909 (Bish.; Brit.; Par.; type material of *Euphorbia multiformis* var. *microphylla* Lévl. *in* Fedde, Repert. 10: 151. 1911 [*non* Boiss.]); *Charles N. Forbes* 720–*K*, left-hand side of Kipu Kai Gap, Haupu Range, Kauai, November 1, 1916 (Bish.); *Forbes* 1,046–*O*, ridge, west side of Nuuanu Valley, Oahu, January 20, 1909 (Field); *Forbes* 1,269–*O*, Moanalua Valley, Oahu, April 6, 1909 (Berl.; Bish.; Del.; Field); *Forbes* 1,426–*O*, west side of Nuuanu Valley, Oahu, December 17, 1909 (Bish.; Field); *Forbes* 1,520–*O*, Nuuanu Pali, Oahu, June 17, 1909 (Field); *Forbes* 1,585–*O*, Popouwela, Waianae Range, Oahu, April 27, 1910 (Field); *Forbes* 2,490–*O*, Manoa Cliff trail, May 1, 1917 (Bish.; Field); *Francis R. Fosberg* 12,189, alt. 375 meters, on dry rock ledges, north ridge of Kahaluu Valley, Koolau Mts., Oahu, July 4, 1935 (Berl.; Bish.; Field); *Fosberg* 14,126, alt. 100–150 meters, crevice in moist basalt cliff, Sacred Falls, Kaluanui Gulch, Koolau Mts., Oahu, June 20, 1937 (Bish.); *Gaudichaud*, Hawaiian Isls., October, 1836 (Del.; determined by Mueller-Argau for his var. *parvifolius*); *Gaudichaud* 289, same locality and date (Del.); *Gaudichaud* 290, same locality and date (Berl.; Del.; Par.; type collection); *Amos Arthur Heller* 2,196, at the Pali, Oahu, April 23, 1895 (Field); *Heller* (similarly) 2,196, Nuuanu Pali, Oahu, October 29, 1895 (Bish.; Field); *William Hillebrand*, Oahu (Berl., 2 sheets; labeled by Hillebrand for his var. β); *Edward Yataro Hosaka* 1,329, plant 2 feet tall, on wooded head of gully, alt. 1,500 feet, Kealia, Waianae Mts., Oahu, February 2, 1936 (Berl.; Bish.; Field); *Edward P. Hume* 348, alt. 1,800 feet, open side hill, Manoa Cliff trail, Koolau Mts., Oahu, November 28, 1931 (Bish.); *Rev. J. M. Lydgate*, Mahaulepu, Kauai (Bish.); *Horace Mann & William T. Brigham* 515, Hawaiian Isls. (Bish.); *Jules Remy* 603, Oahu, 1851–1855 (Field; Par.); *Billie Seamster* (*Otto Degener* distrib. nos.) 8,032 and 8,033, south side of Nuuanu Pali road, Oahu, December 5, 1926 (Deg.); *Adelbert Von Chamisso* 191, Oahu (Berl., where labeled by Mueller-Argau for his var. *ellipticus*; Petrop.); *Von Chamisso* 192, Oahu (Petrop.).

In general, *P. sandwicensis* proper has leaves of ovate to lanceolate shape and more often from 3 to 8 cm. long, while var. *ellipticus* has leaves mostly ovate-oblong, broadly oblong, or suborbicular, and usually 1–3 cm. long. In both forms there is manifest a tendency to have larger leaves above and smaller ones below. Many sheets of var. *ellipticus* in herbaria display sprays with leaves mostly 1.5–2.5 cm. long and sprays with smaller leaves scarcely or little more than half as long. Frequently entire plants, especially from situations exposed to strong winds, have these smaller leaves and then are Mueller's "var. *parvifolius*." Occasionally, the lower branches are more or less prostrate and root here and there, the plants then typifying Mueller's "var. *radicans*." Very rarely, *P. sandwicensis* proper produces a dwarf, leafy form with leaves elliptic-lanceolate and mostly 0.7–2 cm. long. An example of this rare state was collected by Hillebrand at Waianae, but was incorrectly referred by him to var. *parvifolius* Muell. Arg.

Hillebrand (loc. cit.) stated that *P. sandwicensis* proper was found on all of the Hawaiian Islands. The plants found on Molokai and Lanai, however, seem varietally different. They have the twigs commonly more conspicuously 2-winged above, the leaves somewhat more venulose, and the axillary pulvini not hemispherical as in *P. sandwicensis* proper, but elongate-cylindric. In the Lanai material the pulvini are commonly multiple or branched and the entire plant, including even the leaves, has a more or less reddish hue. The Molokai material may be separated as:

Phyllanthus sandwicensis Degeneri var. nov.

Ramuli superne plus alati, pulvinis cylindricis ac plus elongatis.

Branchlets more alate above, axillary cushions cylindric and more elongate.

Specimens examined: *Otto Degener* 8,019 among shrubs in windy, exposed region, on cliffs overlooking Kalaupapa Leper Settlement, Molokai, June 18, 1928 (type, staminate, Field); *Degener* 8,020, among shrubs in windy, exposed situation, on cliffs overlooking and east of Kalaupapa Leper Settlement, Molokai, June 19, 1928 (pistillate, Field); *Degener* 8,021, Halawaiki Gulch, Molokai, June 21, 1928 (Deg.); *Degener & Kazuto Nitta* 8,018, in rainy forest, Wailau Valley, Molokai, August 11, 1928 (Field); *Abbé Urbain Faurie* 484, alt. 1,000 meters, Kamolo, Molokai, June, 1910 (Del., 2 sheets; Par.); *Charles Noyes Forbes* 42-*Mo*, Kalae, Molokai, June, 1912 (Bish.; Field); *Forbes* 431-*Mo*, Kalapamoa, Molokai, August, 1912

(Bish.); *Francis Raymond Fosberg* 13,399, shrub up to 1 meter tall, alt. 600 meters, edge of moist forest, Manawai-Kahananui ridge, Molokai, December 24, 1936 (Berl.; Bish.; Field); *Jules Remy* 601, Molokai, 1851–1855 (Par.); *Joseph F. Rock* 10,104, Halawa Valley, Molokai, April, 1910 (Bish.).

The Lanai material has already been described by Fosberg (Occas. Paps. Bish. Mus. 12: 15: 6. 1936) as forma *rufidus* of *Phyllanthus sandwicensis* var. *oblongifolius.* The var. *oblongifolius*, however, is really synonymous with *P. sandwicensis* proper (as stated above), while the Lanai material is co-varietal with that of Molokai. Fosberg's plant may therefore be designated as:

Phyllanthus sandwicensis var. **Degeneri** f. **rufidus** (Fosb.) comb. nov.

Specimens (of f. *rufidus*) examined: *Charles Noyes Forbes* (*G. C. Munro* distrib. no.) 19, Lanai (Bish.); *Forbes* 45-*L*, mountains near Koele, Lanai, June, 1913 (Berl.; Bish.; Del.; Field); *Francis Raymond Fosberg* 12,410, alt. 950 meters, in moist, open, brushy forest, Haalelepaakai, Lanai, November 28, 1935 (Bish.; isotype), *Fosberg* 12,510, shrub 1 meter tall, alt. 850 meters, in moist, brushy forest, on ridge north of Kaiholena Gulch, Lanai, November 30, 1935 (cotypes, Bish.; Field); *William Hillebrand*, Lanai, 1870 (Berl.); *George C. Munro* 118, Kaiholena, Lanai, August (Bish.).

Phyllanthus nivosus W. G. Smith, Floral Mag. *pl. 120.* 1874; *Phyllanthus sandwicensis* var. *hypoglaucus* Lévl. *in* Fedde, Repert. Spec. Nov. 10: 124. 1911.

Léveillé's *P. sandwicensis* var. *hypoglaucus* was based on Faurie 483, *in sepibus*, Hilo, Hawaii, May, 1909. Faurie's specimen examined by me (Par.) shows that Léveillé's variety, like so many others of his proposed "novelties," was merely a well known cultivated species, *P. nivosus* W. G. Smith.

NOTES ON ANTIDESMA L.

Antidesma platyphyllum Mann, Enum. Haw. Pl. no. 444 (Proc. Amer. Acad. 7: 202). 1867.

Fosberg (Occas. Paps. Bish. Mus. 12: 15: 7–8. 1936) has presented a key to the species and varieties of *Antidesma* for the Hawaiian Islands. For *A. platyphyllum* proper (i. e., var. *genuinum* Pax & Hoffm.) as listed by him without specimens, I present herewith the following list:

Specimens examined: *Brodie* 4,032, Kauai (Bish.); *Edwin H. Bryan, Jr.*, 804, small tree 3–4 meters tall, in rain-forest on ridge, alt. 1,700 feet, Kawailoa, Oahu, October 2, 1934 (Bish.); *Bryan* 852, small tree 4–5 meters tall, fruit green to purple, in lower forest-zone 1, on valley slope, alt. 2,100 feet, Haleauau Valley, Oahu, November 13, 1934 (Bish.); *Bryan, Amy Suehiro, & M. Fukuda*, alt. 1,200–1,400 feet, zone 2, south ridge of Kipapa Gulch, Waipio, Koolau Mts., Oahu, May 15, 1932 (Bish.); *Will Bush* (*Otto Degener* distrib. no.) 8135, Helemano Ridge, Oahu, June 23, 1929 (Deg.); *Erling Christophersen* 1,374, alt. about 500 meters, north slope of Tantalus, Oahu, July 15, 1930 (Berl.; Bish.; Field); *Christophersen* 1,376, same locality and date (Berl.; Bish.; Field); *Otto Degener*, in woods, Kahuaawi Gulch, Molokai, June 5, 1928 (Field); *Degener* 8,122, on dry hillside, Mokomoko Gulch, Molokai, June 7, 1928 (Deg.); *Degener* 8,123, in forest, Kahuaawi Gulch, Molokai, June 5, 1928 (Deg., 2 sheets); *Degener* 8,125, ravine northwest of Puu Makaliilii (where precipice makes further descent impossible), Molokai, May 22, 1928 (Deg.); *Degener* 8,127, Hawaiian Islands, November 16, 1930 (Deg.; Field); *Degener* 8,132, in forest, between summit of Piko Trail and top of Kahanahaiki Valley, Oahu, July 18, 1932 (Deg.); *Degener* 8,136, in wet jungle, between Glenwood and 29 Miles, Hawaii, June 18, 1929 (Deg.); *Degener* 8,144, in forest reserve, on slope of summit of mountain, Kohala, Hawaii, August 8, 1926 (Deg., 2 sheets); *Degener* 8,145, between Glenwood and 29 Miles, July 27, 1926 (Deg.); *Degener* 10,881, in forest, Tantalus crater rim, Oahu, November 12, 1935 (Field); *Degener & Kwan Kee Park* 8,128, in rain-forest, Pig-God Trail, Punaluu, Oahu, August 11, 1931 (Deg., 2 sheets); *Degener, Park, Topping, & Bush* 8,129, same locality, May 31, 1931 (Deg.); *Degener, Takamoto, & Martinez* 10,538, forest tree, C. C. C. Trail, Aiea, Oahu, March 15, 1936 (Deg.; Field); *G. R. Ewart III* no. 10, in forest, alt. 1,800 feet, near top of Kapalama-Waolani Ridge, Oahu, January 10, 1929 (Bish.); *Abbé Urbain Faurie* 308, alt. 1,200 meters, Olinda, East Maui, August, 1909 (Bish.; Par.); *Charles Noyes Forbes*, Maui, 1920 (Berl.; Bish.; Field; leaves slightly hispidulous beneath near midnerve); *Forbes*, Waiolani back of Honolulu, Oahu, July 8, 1908 (Bish.; Field); *Forbes*, Waialae Iki, Oahu, October 10, 1908 (Bish.); *Forbes* 90–*M*, Iao Valley, West Maui, June, 1910 (Berl.; Bish.; Field); *Forbes* 232–*M*, in woods east of Makawao, East Maui, July, 1910 (Bish.; Field); *Forbes* 250–*L*, mountains at east end of Lanai, June, 1913 (Berl.; Bish.; Del.; Field; Par.); *Forbes* 345–*H*, Kapua, Kona, Hawaii, July 23, 1911 (Berl.; Bish.; Field; leaves very obscurely setulose beneath, thus somewhat approaching those of var. *hamakuaense*); *Forbes* 420–*M*, Honokahau

Drainage Basin, West Maui, September 25–October 17, 1917 (Berl.; Bish.; Field); *Forbes* 1,039–*H*, Volcano Road, Hawaii, July 2, 1915 (Bish.); *Forbes* 1,634–*M*, above the plantation, Kipahulu Valley, East Maui, November 13, 1919 (Berl.; Bish.; Field); *Forbes* 2,336–*M*, central ridge of Olowalu Valley, West Maui, May 12, 1920 (Bish.); *Forbes* 2,613–*M*, Waikamoi Trail, East Maui, June 25, 1920 (Bish.); *Francis Raymond Fosberg* 10,393, tree 5 meters tall, drupes dark red, in wet forest, alt. 250 meters, ditch trail, Kahana Valley, Kahana, Oahu, November 26, 1933 (Bish.); *Fosberg* 10,415, tree 5 meters tall, drupes dark red, alt. 250 meters, in wet forest, ditch trail, Kahana Valley, Kahana, November 26, 1933 (Bish.); *Fosberg* 10,817, tree 8 meters tall, fruit black, on steep, wooded slope, alt. 800 meters, Haleanau Valley, Puu Kaala, Waianaeuka, Oahu, February 24, 1937 (Bish.); *Fosberg & K. Duker* 8,787, tree 12 meters tall, in wet forest, alt. 300 meters, Waikane-Schofield Trail, Waikane, Koolau Mts., Oahu, October 16, 1932 (Bish.); *Fosberg & St. John* 8,897, alt. 500 meters, in wet forest at head of 2nd gulch east of Puu Kaupakuhale, Mokuleia, Oahu, October 23, 1932 (Bish.); *Fosberg* 10,933, tree 6 meters tall, alt. 815 meters, in dry forest, Forest Reserve house, southeast of Palikea, Waianae Mts., Oahu, June 30, 1935 (Bish.; Field); *Fosberg* 10,969, tree 8 meters tall, alt. 800 meters, on wet, wooded ridge above Kupehau, Waianae Mts., Oahu, June 30, 1935 (Bish.; Field); *Fosberg* 13,490, tree 7 meters tall, fruits reddish-black, in wet, open forest, alt. 450 meters, trail up Waiakeakua-Waiokeela ridge, head of Wailau Valley, Molokai, December 29, 1936 (Bish.); *Fullaway & Giffard*, 10 Miles, Hawaii, August, 1919 (Bish.; leaves slightly pubescent beneath, especially near median nerve); *Fullaway & Giffard*, 23 Miles, Hawaii, August 9, 1919 (Bish.; leaves pubescent beneath along midnerve); *D. Wesley Garber* 485, Pauoa-Konahuanui trail, Oahu, July 11, 1920 (Bish.); *Garber & Forbes* 177, right fork of Wailupe Valley, Oahu, January 12, 1920 (Bish.); *William Hillebrand*, Oahu (Berl.; leaves pubescent beneath along midnerve); *Hillebrand* Kalae, Molokai (Berl.); *Hillebrand*, woods of Pumelei, Hawaii (Berl.); *Hillebrand & Rev. J. M. Lydgate*, Makawao, East Maui (Bish.); *Edward Yataro Hosaka* 72, on wooded slope, alt. 2,000 feet, Puu Manawahua, Waianae Mts., Oahu, December 8, 1929 (Bish.); *Hosaka* 715, tree 15 feet tall, on wet, denuded ridge, south ridge, Kipapa Gulch, Waipio, Oahu, September 18, 1932 (Bish.); *Hosaka* 926, tree 20 feet tall, in moist woods, alt. 1,500 feet, south ridge, Kipapa Gulch, Waipio, Oahu, March 5, 1933 (Bish.); *Hosaka* 1,109, tree 20 feet tall, alt. 2,000 feet, on wet, denuded ridge, south ridge, Kipapa Gulch, Waipio, Oahu, July 2, 1933 (Berl.; Bish.; Del.; Field); *Hosaka* 1,203, tree 10 feet tall, on denuded ridge, Kipapa Gulch, August 8, 1933 (Bish.); *Edward P. Hume* 212, tree on wooded ridge, alt. 1,200 feet, Puu Peahinaia, Koolau Mts., Oahu, October 4, 1931 (Field); *Frank Kitamura*, in moist, wooded region, alt. 950 feet, Hauula Forest Reserve, Kahana Valley, Oahu, December 10, 1933 (Bish.); *Rev. J. M. Lydgate*, Molokai (Berl.); *Horace Mann & William T. Brigham* 427, woods near Makawao, East Maui (Corn.); *William Meinecke*, in woods, alt. 1,500 feet, Manana-Waimano ridge, Oahu, April 9, 1933 (Bish.); *Meinecke*, in a saddle at about 1,800 feet alt., Waikakalaua-Kipapa Ridge, Oahu, June 12, 1933 (Bish.); *George C. Munro* 63, Aukuu Hill, Lanai, October 5, 1913 (Bish.); *Munro* 138, Pohaku, Lanai, October 5, 1913 (Bish.; Field); *Kazuto Nitta* 8,146, on moderately dry slope, Mt. Kaala, Oahu, October 13, 1929 (Deg.); *Jules Remy* 609 *pro parte*, Hawaiian Isls., 1851–1855 (Par.); *Joseph F. Rock* 4,593, Hiilawe, Waipio, Hawaii, July 18, 1909 (Bish.); *Rock* 4,836, Palolo Valley, Oahu (Berl.; Bish.; Field); *Rock* 10,096, "Kailua lower ditch trail," East Maui, May, 1911 (Bish.); *Rock* 10,097, Kapua, South Kona, Hawaii, January, 1912 (Bish.); *Harold Saint-John* 9,911, bushy tree 15 feet tall, alt. 2,200 feet, ridge of Puu Manawahua, Waianae Mts., Oahu, September 29, 1929 (Bish.); *St. John* 10,572, alt. 1,100 feet, on wooded slope in Waikakalaua Gulch, Waipio, Koolau Mts., Oahu, September 14, 1930 (Bish.); *St. John* 10,613, small tree on wooded ridge, alt. 1,700 feet, Paalaa, South Opaeula Gulch, Oahu, November 9, 1930 (Bish.); *St. John* 11,184, tree 25 feet tall, common, fruit dark purplish, alt. 1,800 feet, on wooded ridge, main ridge running southwest from Puu Lanihuli, Kalihi-Nuuanu, Oahu, November 29, 1931 (Berl.; Bish.; Del.; Field; Par.); *St. John & Fosberg* 13,957, tree 25 feet tall with trunk 8 inches thick, in moist woods, alt. 950 feet, Wainiha Valley, side gulch on west side, 0.75 mile upstream from intake, Kauai, January 1, 1934 (Field); *Carl Skottsberg* 54, on ridge back of Tantalus, Oahu, August 7, 1922 (Bish.); *Skottsberg* 337, Palehua Camp, Waianae, Oahu, August 24, 1922 (Bish.); *Amy Suehiro*, Laie Ridge, Oahu, February 14, 1932 (Bish.); *D. LeRoy Topping* 2,869, tree 30 feet tall, in gulch back of Schofield, Oahu, September 21, 1924 (Deg.); *Topping* 3,199, Manoa Cliff Trail, Oahu, April 12, 1925 (Deg.).

Antidesma platyphyllum var. **genuinum** f. **rubrum** Degener & Sherff, f. nov.

A var. *genuino* sensu stricto fructibus maturis rubris non purpureo-atris differt.

Differs from var. *genuinum* proper in having mature fruits red instead of purplish-black.

Specimens examined: *Otto Degener* 8,131, in rain-forest, Pupukea-Kahuku trail at divide, Oahu, January 24, 1932 (type, Field).

Degener's label states: "Mature fruit red! Only 1 tree of that color seen. All others, and there were many, had purple-black fruit. This is fruiting season." The dried fruits of the type sheet are now blackish and would pass for those of the variety *genuinum* proper.

It is possible that a number of the specimens above cited for *A. platyphyllum* proper were really this forma. A wide range of colors, from dull reddish to deep blackish-purple, was observed in the dried fruits. However, none of the fruits had been noted when fresh as other than reddish-black or purplish-black.

Antidesma platyphyllum var. **hamakuaense** Fosberg, Occas. Paps. Bish. Mus. 12: 15: 8. 1936.

Fosberg cited for this variety only three specimens, all of them from the Island of Hawaii. I have had the privilege of examining no fewer than eleven specimens, one of them from Oahu, and present herewith an amplified list of:

Specimens examined: *Erling Christophersen* 1,375, alt. about 500 meters, north slope of Tantalus, Oahu, July 15, 1930 (Bish.; Field; in no way intergrading with *Christophersen* 1,376 of species proper!); *Otto Degener* 8,142, in wet jungle, between Glenwood and 29 Miles, Hawaii, July 23, 1926 (Deg.); *Charles N. Forbes* 650-*H*, Olaa Flume, Hawaii, June 2, 1915 (Bish.); *Francis Raymond Fosberg* 10,461, bush 3 meters tall, alt. 435 meters, in wet forest, hills above Akaka Falls, Honomu, Hawaii, December 8, 1933 (Bish.); *Fosberg* 10,506, shrub 3 meters tall, alt. 460 meters, in wet forest, side of gulch, Awehi Stream above Hilo, Hawaii, December 7, 1933 (Bish.); *William Hillebrand & Rev. J. M. Lydgate*, Hawaiian Isls. (Bish., *cum A. pulvinato commixt.*); *Jules Remy* 609 *pro parte*, Hawaii, 1851–1855 (Par.); *Joseph F. Rock* 4,327, Paauhau 3, Hawaii, July 5, 1909 (Bish.); *Carl Skottsberg* 478, Puu Kauku, Makahanaloa, Hawaii, September 11, 1922 (Bish.); *Skottsberg* 1,975, alt. 800 meters, Kukaiau ranch, northeast slope of Mauna Kea, Hawaii, September 29, 1926 (Bish.; leaves pubescent beneath on nerves).

Antidesma platyphyllum var. **Hillebrandii** Pax & Hoffm. *in* Engler, Pflanzenreich IV. 147. xv. 162. 1922; *A. platyphyllum* var. β Hillebr. Fl. Haw. Isls. 403. 1888.

Fosberg (loc. cit.) stated that "all the antidesmas from Kauai apparently belong to this variety." *Skottsberg* (Meddel. Göteborgs Botan. Trädgård 10: 120. 1936) somewhat earlier had confessed doubt that this variety deserved to be distinguished under a special name. My own judgment, after an extended examination of much herbarium material, is that the variety is a valid one but that, contrary to Fosberg's somewhat qualified opinion, the Island of Kauai harbors at least one other variety of *A. platyphyllum* (vide *A. platyphyllum var. subamplexicaule* infra). For the var. *Hillebrandii* I present the following list of:

Specimens examined: *Brodie* 4,033, Kauai (Bish.); *Otto Degener* 8,141, on dry slope overlooking Waimea Canyon, along road leading to Kokee, Kauai, June 22, 1926 (Deg.); *Francis R. Fosberg* 12,649, tree 8 meters tall, in moist forest, alt. 1,100 meters, southeast side of Kumuwela Ridge, above Waimea Canyon, Kauai, December 28, 1935 (Bish.); *Amos Arthur Heller*, Kauai, 1895 (Bish., 2 sheets); *Heller* 2,497, on the ridge west of the Hanapepe River, Kauai, July 11, 1895 (Corn., 2 sheets; Field; Par.); *Heller* (similarly) 2,497, same locality, August 6, 1895 (Field); *Heller* (similarly) 2,497, on Kaholuamanu, above Waimea, Kauai, September 2-9, 1895 (Corn.); *Heller* (similarly) 2,497, same locality, September 10-16, 1895 (Field); *Heller* (similarly) 2,497, same locality, October 11-16, 1895 (Del.); *V. Knudsen* 112, Kauai (Berl., type); *Jules Remy* 611, Kauai or Niihau, 1851-1855 (Par.); *Joseph F. Rock* 1,752, Kaholuamanu, Kauai, March 3-10, 1909 (Bish.); *Rock* 5,320, alt. 3,200 feet, below Gay's mountain house, Kaholuamanu Forest, Kauai, September, 1909 (Berl.; Bish.; Field); *Rock* 12,935, Kaholuamanu, October, 1911 (Berl.; Bish.; Field); *Rock* 17,092, same locality, October, 1916 (Bish.); *Saint-John, Hosaka, Hume, et alii* 10,811, alt. 2,600 feet, in woods, Nualolo Trail, Na Pali-Kona Forest Reserve, Kauai, December 28, 1930 (Berl.; Bish.; Field).

Antidesma platyphyllum subamplexicaule var. nov.

Foliorum petioli veri breves (circ. 2 rarius usque ad 4 mm.) et crassiores; laminis glabris demum saepe conduplicatis, siccis non (vel vix sub-) nitidis, saepe 1-1.5 dm. longis et 5.5-7 cm. latis, basi rotundato cordatove plus minusve subamplexicaulibus. Fructus valde compressi, 6-12 mm. longi.

True petiolar portion of leaves short (about 2 more rarely up to 4 mm.) and thicker; blades glabrous, finally often conduplicate, when dry not (or scarcely sub-) glistening, often 1-1.5 dm. long and

5.5–7 cm. wide, more or less subamplexicaul at their rotundate or cordate base. Fruits much compressed, 6–12 mm. long.

Specimens examined: *Otto Degener* 8,138, Hali Valley, Kauai, June 11, 1926 (Deg.); *Degener* 8,139, same locality and date (Deg.; Field); *Degener* 8,140, north of Wahiawa, Kauai, June 20, 1926 (Deg.); *Degener* 10,879, in forest, same locality and date (Deg.); *Abbé Urbain Faurie* 304, alt. 1,000 meters, Waimea, Kauai, February, 1910 (Par.); *Charles N. Forbes* 118–*K*, Waioli Valley, Kauai, August 2, 1909 (Berl.; Bish.; Field); *Forbes* 509–*K*, mountains above Ka Loko Reservoir (Kilauea), Kauai, October 7, 1916 (type, Bish.).

As already remarked, Fosberg states that all the antidesmas from Kauai apparently belong to *A. platyphyllum* var. *Hillebrandii* Pax & Hoffm. The var. *subamplexicaule,* material of which seems not to have been seen by Fosberg, contrasts sharply with the type and other above cited specimens of var. *Hillebrandii* in having mature fruits with more strongly flattened stone, leaves less shiny or even dull, usually longer, much more shortly and thickly petioled, and, especially when conduplicate in age, tending at their base to clasp the branch or subtended branchlet. Regarding Fosberg's statement, it may be remarked further that at least two specimens (*Brodie* 4,032 and *St. John & Fosberg* 13,957) from Kauai appear to represent the species proper.

Antidesma pulvinatum Hillebr. Fl. Haw. Isls. 403. 1888.

Fosberg (loc. cit.) says that *A. pulvinatum* is found "in dry regions on Hawaii, Maui, and the Waianae Mountains, Oahu." It occurs also on the islands of Kauai and Molokai, as may be seen from the following list of:

Specimens examined: *Erling Christophersen* 3,673, tree, 450 meters alt., open ridge, Valley 2, below Kanehoa, central Lualualei, Waianae Mts., Oahu, June 1, 1932 (Berl.; Bish.; Del.; Field); *Christophersen* 3,679, tree 6–7 meters tall, alt. 450 meters, in forest, upper part of Valley 4, below Kanehoa, June 1, 1932 (Berl.; Bish.; Field); *Otto Degener* 8,124, in dry region, valley west of East Ohia, Molokai, July 16, 1928 (Deg.); *Degener* 8,126, in dry, rocky ravine, northwest of Puu Makaliilii, Molokai, May 22, 1928 (Deg.; Field); *Degener* 8,130, on dry talus slope, west branch of valley at pali in Waianae Valley near Kolekole Pass, Oahu, April 26, 1931 (Deg.); *Degener* 8,133, with *Bobea* in extremely arid *aa* lava waste, Ulupalakua, East Maui, June 23, 1927 (Deg.; Field); *Degener* 8,137, in arid *aa* lava *kipuka,* between Kaalualu and Waiohinu, Hawaii, September 13, 1929 (Deg.; Field); *Degener* 8,143, moderately dry, open woods, along roadside on 1926 lava flow, Hawaii, July 25, 1926 (Deg., 2 sheets); *Degener* 11,011, Kamokiuki Valley, Oahu, April 12, 1933 (Berl.; Deg.; Field); *Degener, Park, Takamoto, Bush, & Topping* 10,876, edge of decadent forest, east side of Palikea along C. C. C. trail, Oahu, March 1, 1936 (Deg.; Field); *Degener & Takamoto* 10,880, dry forest, Middle Palawai Ridge, Oahu, May 12, 1936 (Deg.; Field); *Abbé Urbain Faurie* 305, Kaala, Kauai, December, 1909 (Par.); *Charles Noyes Forbes* 369-*H*, Kapua, South Kona, Hawaii, July 26, 1911 (Berl.; Bish.; Del.; Field); *Forbes* 370-*H*, same locality and date (Berl.; Bish.; Field); *Forbes* 1,784-*M*, "Kamaio" (Kanaio?), Maui, March 1, 1920 (Bish.); *Forbes* 1,805-*M*, growing 12-15 feet tall, southwest slope of Haleakala, East Maui, March 2, 1920 (Bish.; Field); *Forbes* 1,963-*M*, Auwahi, south slope of Haleakala, March 14, 1920 (Berl.; Bish.; Del.; Field); *Forbes* 2,315-*M*, ridge at left-hand side of Olowalu Valley, West Maui, May 10, 1920 (Bish.); *Francis Raymond Fosberg* 12,345, small tree, alt. 450 meters, near bottom of wet, shaded gulch, south side of Makua Valley, Waianae Mts., Oahu, November 17, 1935 (Bish.); *Fosberg* 13,087, spreading tree 5 meters tall, alt. 550 meters, dry, wooded gully, Pohakea Pass, Halona Valley, Lualualei, Oahu, May 3, 1936 (Bish.; Field); *Fosberg & Otto Swezey* 10,932, tree 5 meters tall, alt. 550 meters, dry slope, side of gulch, almost smothered by *Lantana* and *Canavalia*, Honouliuli, Waianae Mts., Oahu, June 30, 1935 (Bish.); *V. O. Fosberg* 47*a*, tree 6 meters tall, in lantana and guava shrubbery, dry forest, beyond Hoopuloa Flow, Milolii, South Kona, Hawaii, August 10, 1936 (Bish.; Field); *William Hillebrand*, South Kona, Hawaii (Bish.); *Hillebrand*, Halawa, Oahu (Berl.); *Hillebrand*, Maui (Berl., *sub nom. A. barbigero*); *Hillebrand*, gulch back of Lahaina, West Maui, August, 1870 (Berl.); *Hillebrand & Rev. J. M. Lydgate*, Hawaiian Isls. (Bish., *cum A. platyphyllo var. hamakuaensi commixt.*); *A. F. Judd & Edward Y. Hosaka*, alt. 1,400 feet, on wooded ridge, Papaia Valley, 6th valley east of Makaleha Valley, Waianae Mts., Waialua, Oahu, December 2, 1931 (Berl.; Bish.; Field); *Noel H. Krauss*, alt. 800–1,000 feet, Piko trail, Kahanahaiki Valley, Waianae Mts., Oahu, December 30, 1933 (Bish.); *Rev. J. M. Lydgate*, West Maui (Berl.); *Joseph F. Rock* 8,650, alt. 2,000–2,600 feet, along government road, Ulupalakua, Auwahi-Kahikinui, East Maui, November, 1910 (Berl.; Bish.; Field); *Rock* 10,021, Kapua, South Kona, Hawaii, January, 1912 (Berl.; Bish.; Del.; Field; Gray); *Harold Saint-John, E. Y. Hashimoto, E. Y. Hosaka, J. C. Lindsay, & D. D. Mitchell* 11,335, tree 25 feet tall, alt. 1,000 feet, wooded *kipuka*, Manuka Mauka, Hawaii, December 26, 1931 (Berl.; Bish.; Field); *iidem* 11,351, alt. 1,800 feet, *aa* lava, wooded *kipuka*, Manuka Mauka, December 27, 1931 (Bish.; Field).

Antidesma pulvinatum leiogonum var. nov.

Folia non venarum lateralium angulis cum mediana pulvinata sed glabra vel interdum paucisetulosa, apice saltem pauca obtusa forsitan numquam acuminata. Flores fructusque non visi.

Leaves not cushioned in the angles of the lateral veins with the median vein but glabrous or at times few-setulose, at least a few of them apically obtuse though perhaps never acuminate. Flowers and fruits not seen.

Specimens examined: *Truman G. Yuncker & Edward Yataro Hosaka* 3,214, in 4th gulch east of Puu Kaupakuhale, Waianae Mts., northwestern Oahu, October 23, 1932 (type in herb. Yuncker).

A single specimen seen, this among some specimens sent me a year or so ago by Dr. Truman G. Yuncker, Professor of Botany at De Pauw University, Greencastle, Indiana.

A NEW VARIETY OF EUPHORBIA MULTIFORMIS HOOK. & ARN.

Euphorbia multiformis mohihiensis var. nov.

Habitu *Euphorbiae multiformis* varietati *microphyllae* Boiss. similis. Capitula magna 2–4 mm. lata, glandulis perspicuis, involucro non nisi ad apicem pubescenti. Folia elliptico-oblonga vel spathulato-oblanceolata, apice non retusa. Capsulae stipes glaber.

Similar in habit to *Euphorbia multiformis* var. *microphylla* Boiss. Capitula large, 2–4 mm. wide, glands conspicuous, involucre not pubescent except at apex. Leaves elliptic-oblong or spathulate-oblanceolate, at apex not retuse. Stipe of capsule glabrous.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 3,022, on ridge east of Mohihi River, Kawaiu Trail, western Kauai, Hawaiian Isls., August 19, 1938 (type and cotype, Goth.).

SOME NEW OR OTHERWISE NOTEWORTHY LABIATAE AND COMPOSITAE

EARL EDWARD SHERFF

Since the appearance of my monographic works upon certain genera of Labiatae and Compositae (Revision of Tetramolopium, Lipochaeta, Dubautia, and Railliardia, Bishop Mus. Bull. 135. 1935; Revision of Haplostachys, Phyllostegia, and Stenogyne, Bishop Mus. Bull. 136. 1935; Revision of the genus Coreopsis, Field Mus. Bot. Ser. 11: 279-475, *figs. 1-3*, 1936; The genus Bidens, op. cit. 16. 1937), a vast amount of mostly more recently acquired herbarium material has been lent to me for study, most of it from the institutions and individuals whose aid has already been acknowledged in the preface to my paper on *Labordia.* Many of the specimens studied were found to be new to science; these are described in the following pages. Some others were important in various other respects, such as offering range extensions or throwing additional light upon the interpretation of taxonomic concepts proposed by certain other writers. So far as possible, these too receive attention. (For explanation of abbreviations used for herbaria cited, see p. 464.)

Phyllostegia mollis Skottsbergii var. nov.

Caulis subtetragonus, moderate glandulosus, dense retrorsumque hispidulus. Folia glandulosa, supra subsparsim vel secundum venas dense adpresso-hispida, infra paulo hispidiora. Inflorescentiae rami glanduloso- et patenti-hispidi, verticellastris 4- vel 6-floris; pedicellis tenuibus, patenti- et glanduloso-hispidis, plerumque 4–10 mm. longis. Calycis densissime glandulosi et moderate adpresso-hispiduli tubus 4–5 mm. longus, lobi acuti 1–2 mm. longi. Corollae extus minute adpresso-hispidulae tubus ±1.2 cm. longus, labrum superius circ. 4 mm. longum inferius ±9 mm. longum.

Stem subtetragonal, moderately glandular, densely and retrorsely hispidulous. Leaves glandular, subsparsely or along veins densely appressed-hispid above, slightly more hispid beneath. Branches of inflorescence glandular- and spreading-hispid, verticellasters 4- or 6-flowered; pedicels slender, spreading- and glandular-hispid, commonly 4–10 mm. long. Calyx densely glandular and moderately appressed-hispidulous, its tube 4–5 mm. long and acute lobes 1–2 mm. long. Corolla minutely appressed-hispidulous on outer surface, its tube ±1.2 cm. long, upper lip about 4 mm. long and lower lip ±9 mm. long.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 3,039, in forest, Kalalau Trail, Kokee region, northwestern Kauai, Hawaiian Isls., August 20, 1938 (Goth.); *Gerrit Parmile Wilder* 451, erect herb, 2 feet tall, alt. 3,600 feet, in dense woods, Kokee, Isl. Kauai, March 8, 1926 (type, Field).

Some years ago, in preparing a monographic treatment of *Phyllostegia*, I concluded the Wilder plant to be new, but laid it aside, preferring to wait for additional and more ample material before drawing up a formal description. With the more recently collected material now before me, sent by Dr. Skottsberg, it becomes possible to obtain a reliable description. The two specimens match each other remarkably and leave no doubt that they represent a new variety of *Phyllostegia mollis* Benth., a species sometimes found on the Island of Kauai, but which has the leaves softly canescent beneath, the pedicels eglandular, the calyces only 3–4 mm. long, corollas smaller, etc. This variety is apparently most closely allied with *P. mollis* var. *Lydgatei* Sherff.

Stenogyne microphylla Benth. Lab. 655. 1835; DC. Prodr. 12: 556. 1848.

In my monographic study of the genus *Stenogyne* (Bull. Bish. Mus. 136: 59–101. 1935), I found no specimens of *Stenogyne microphylla* Benth. that had been collected subsequent to the year 1872 (cf. loc. cit. 98). Recently Mr. Edward Yataro Hosaka, Assistant Curator of Botany at Bernice Bishop Museum in Honolulu, found a lone plant of it as he was "going around Mauna Kea at 6,200 feet altitude." He writes: "This species seems to be very rare since I saw only one single plant the whole day." From the plant observed he obtained two specimens for my examination (they have since been deposited with Field Museum and the Natural History Museum of Paris). He describes the plant as "a freely branching vine with flowers greenish-yellow." The exact locality and date were: Hinahina [i. e., Puu Kahinahina], Humuula, North Hilo, Hawaii, April 24, 1939.

Stenogyne Cranwelliae sp. nov.

Habitu *S. Calaminthoidi* similis. Caulis elongatus, flexuosus, viridis vel atro-purpurascens, circ. 1.5–2.5 mm. crassus, acriter tetragonus, angulis retrorsum acriterque albido-setosus et plus minusve phellopterus. Folia petiolata petiolis gracilibus retrorsum densissimeque albido-ciliatis 3–8 mm. longis; lamina rotundo-cordata vel ovato-cordata, crenato-serrata circ. 8–14 dentibus pro utroque latere, apice obtusa rotundatave, supra glabra, infra sparsissime adpresso-hispida, 1.5–2.6 cm. longa et 1.2–2.2 cm. lata. Flores 2–6 pro nodo quoque, graciliter pedicellata pedicellis glaberrimis vel rarius subpubescentibus 2–5 mm. longis; calyce subcampanulato vel obconico, extus glabro sed apice subciliato, 10- vel sub-20-nervato, tubo 3–4 mm. longo, lobis latissimis obtusissimisque ±1 mm. longis; corolla aegre curvata superne sensim dilatata sicca subpurpurea, extus praecipue supra albido-setosa, tubo ±9 mm. longo, labro superiore circ. 5 mm. longo, inferiore circ. 2–3 mm. longo.

Similar in habit to *S. Calaminthoides* A. Gray. Stem elongate, flexuous, green or dark purple, about 1.5–2.5 mm. thick, sharply tetragonal, more or less corky-winged upon the retrorsely and sharply whitish-setose angles. Leaves petiolate; petioles slender, retrorsely and very densely whitish-ciliate, 3–8 mm. long; blade rotund-cordate or ovate-cordate, crenate-serrate with about 8–14 teeth to each side, apically obtuse or rounded, glabrous above, very sparsely appressed-hispid beneath, 1.5–2.6 cm. long and 1.2–2.2 cm. wide. Flowers 2–6 to each node, delicately pedicelled with very glabrous or more rarely subpubescent pedicels, these 2–5 mm. long; calyx subcampanulate or obconic, externally glabrous but at apex subciliate, 10- or sub-20-nerved, its tube 3–4 mm. long, lobes very wide and very obtuse, ±1 mm. long; corolla weakly curved, gradually dilated upwardly, purplish when in dried state, whitish-setose outside especially above, its tube ±9 mm. long, upper lip about 5 mm. long, lower lip about 2–3 mm. long.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 3,185, on top of pali above (i. e., at head of) Waipio Valley just below first ditchman's house, Kohala, Isl. Hawaii, Hawaiian Isls., September 9, 1938 (2 type sheets, Goth.).

A species allied most closely with *S. Calaminthoides* A. Gray. From that species it differs, however, in having: leaf-petioles 3–8 not 8–12 mm. long, leaf-blades 1.5–2.6 not 2–6 cm. long and 1.2–2.2 not 1.5–4.5 cm. wide, calyx 4–5 not 8–12 mm. long, corolla about 1.4 not 2.5–4 cm. long, its lower lip a half shorter than and not subequal to the upper, etc. It is a pleasure to name this interesting species after one of its collectors (Miss Lucy May Cranwell, M. A., Curator, Department of Botany, Auckland Institute and Museum, Auckland, New Zealand).

Lipochaeta dubia Degener & Sherff, sp. nov.

Frutex decumbens, ramosus, ramis tenuibus ±1 mm. crassis angulatis sparsim vel moderate adpresso- et antrorso-setosis. Folia petiolata petiolis gracilibus antrorsum hispidis usque ad ±1.5 cm. longis, petiolo adjecto usque ad ±4.5 cm. longa; lamina plerumque tripartita, segmento terminale elongato lineari-oblongo vel lineari-oblanceolato apice acuto marginaliter denticulato, segmentis lateralibus brevibus saepe plus minusve bipartitis, omnibus superne viridibus moderate adpresseque antrorso-hispidis inferne pallidis dense adpresseque antrorso-hispidis, venis infra moderate elevatis. Capitula graciliter pedunculata pedunculis saepius 3–5 cm. longis, ligulata, pansa ad anthesin 1.5–2.5 cm. lata et circ. 6 mm. alta. Involucri bracteae oblongae, apice acutae, dense adpresseque antrorso-hispidae, 3–5 mm. longae. Flores ligulati 6–8, flavi, ligula lineari-oblongi, 7–11 mm. longi, apice subintegri vel obtuse bidenticulati. Achaenia obovata, plerumque triquetra angulis alata alis laceratis apice in spinulam incurvatam productis, corpore circ. 2 mm. longa, apice centraliter circ. 4-aristata aristis subrectis validis flavidis saepius 1–1.5 mm. longis.

Decumbent shrub, branched; branches slender, ±1 mm. thick, angled, sparsely or moderately appressed- and antrorse-setose. Leaves petiolate, up to ±4.5 cm. long including the slender and forwardly hispid petiole (this up to ±1.5 cm. long); blade commonly tripartite, terminal segment elongate, linear-oblong or linear-oblanceolate, at apex acute, at margin denticulate, lateral segments short and often more or less bipartite, all segments moderately and appressedly antrorse-hispid on their green upper surface and densely and appressedly antrorse-hispid on their pale lower surface, the veins moderately salient beneath. Heads slenderly peduncled, ligulate, 1.5–2.5 cm. wide and about 6 mm. tall when expanded at anthesis; peduncles more often 3–5 cm. long. Involucral bracts oblong, at apex acute, densely and appressedly antrorse-hispid, 3–5 mm. long. Ligulate florets 6–8, yellow, 7–11 mm. long, at apex subentire or obtusely bidenticulate, ligule linear-oblong. Achenes obovate, commonly triquetrous and winged at angles (wings lacerate and at apex produced into a small, incurved spine), about 2 mm. long as to body proper, at center of apex about 4-aristate; aristae slightly bent, stout, yellowish, more often 1–1.5 mm. long.

Specimens examined: *Otto Degener, Emilio Ordoñez, & J. Foster* 12,285, among lantanas and grasses, northeast slope of Puu Hapapa, Oahu, April 2, 1939 (Berl.; Deg.; Field); *iidem* 12,287, within 100

feet of no. 12,285, same date (Berl.; Deg.; Field); *iidem* 12,290, within 100 feet of nos. 12,285 and 12,287, same date (Berl.; Deg.; Field); *iidem* 12,331, among thick, dry grasses, within 100 feet of nos. 12,285, 12,287, and 12,290, May 7, 1939 (type, Field).

Lipochaeta lavarum (Gaud.) DC. Prodr. 5: 611. 1836.

In my revision of the genus *Lipochaeta* DC. (Bernice P. Bishop Mus. Bull. 135: 23–83. 1935), I referred all material of *L. lavarum* either to the species proper or to its variety *longifolia*. Subsequent study has shown that *L. lavarum* proper is apparently absent from Lanai, but that, in addition to the broad-leaved var. *longifolia*, of Maunalei Valley, there are four fairly well marked narrow-leaved varieties on that island. These differ at once from *L. lavarum* proper by their narrower leaves, which have much less salient and much less reticulate venation, also by the presence commonly of only one instead of three lengthwise veins. They are described below and may be severally distinguished according to the following key:

a. Leaves mostly serrate; achenes not fimbriately bordered at top. var. *maneleana*.

a. Leaves mostly entire or obscurely denticulate; achenes fimbriately bordered at top.

  b. Flowering heads ±1.3 cm. wide................var. *Stearnsii*.

  b. Flowering heads 2–3.5 cm. wide.

    c. Secondary leaves rather numerous and clustered, mostly attenuate-linear..........................var. *conferta*.

    c. Secondary leaves few and remote, mostly oblong-linear or spatulate-linear........................var. *lanaiensis*.

Lipochaeta lavarum Stearnsii Degener & Sherff, var. nov.

Folia spathulate linearia, subintegra, inferne in petiolum tenuem usque ad ±7 mm. longum sensim attenuata, apice obtusa vel plus minusve acuta, subtenuia, utrinque canescentia, longitudinaliter 1-nervia, arcuate penninervia, primaria perpauca visa petiolo adjecto ±6 cm. longa et 5–7 mm. lata, secundaria (subnumerosa) 2–4 cm. longa et 3–5 mm. lata. Capitula minora pansa ad anthesin ±1.3 cm. lata et circ. 4.5 mm. alta, disco demum circ. 9 mm. lato et circ. 6 mm. alto. Involucri bracteae exteriores ovatae subacutae 2.5–3.5 mm. longae. Flores ligulati tantum circ. 6–7 mm. longi. Achaenia fimbriato-coronata et plerumque aristata.

Leaves spatulately linear, subentire, gradually narrowed below into a slender petiole ±7 mm. long, apically obtuse or more or less acute, somewhat thin, on both surfaces canescent, lengthwise 1-nerved, arcuately penninerved, primary ones (only a very few seen) ±6 cm. long including petiole and 5–7 mm. wide, the subnumerous secondary ones 2–4 cm. long and 3–5 mm. wide. Capitula smaller, about 4.5 mm. tall and ±1.3 cm. wide when expanded at anthesis, disc finally about 9 mm. wide and about 6 mm. tall. Exterior involucral bracts ovate, subacute, 2.5–3.5 mm. long. Ligulate florets only about 6–7 mm. long. Achenes fimbriately crowned and commonly aristate.

Specimens examined: *Harold Stearns* (*Otto Degener's* distrib. no.) 11,050, alt. 800 feet, Kapoho Canyon, Isl. Lanai, Hawaiian Isls., June, 1936 (type, Field).

Lipochaeta lavarum lanaiensis var. nov.

Rami elongati subsimplicesque, internodiis saepe 5–10 cm. longis. Folia plerumque oblongo-linearia vel spathulato-linearia, subintegra, inferne in petiolum tenuem usque ad 1.5 cm. longum sensim attenuata, longitudinaliter 1-nervia, moderate penninervia, apice subobtusa, utrinque canescentia, petiolo adjecto 2–4 cm. longa et 4–7 mm. lata. Capitula pansa ad anthesin 2–3.5 cm. lata et circ. 5 mm. alta, disco demum ±8 mm. lato et ±4 mm. alto. Involucri bracteae ovatae subacutae vel acutae, ±3 mm. longae. Achaenia fimbriato-coronata et plerumque aristata.

Branches elongate and subsimple, internodes often 5–10 cm. long. Leaves commonly oblong-linear or spatulate-linear, subentire, gradually narrowed below into a slender petiole up to 1.5 cm. long, lengthwise 1-nerved, moderately penninerved, at apex subobtuse, on both surfaces canescent, 2–4 cm. long including petiole and 4–7 mm. wide. Capitula 2–3.5 cm. wide when expanded at anthesis and about 5 mm. tall, disc finally ±8 mm. wide and ±4 mm. tall. Involucral bracts ovate, subacute or acute, ±3 mm. long. Achenes fimbriate-crowned and commonly aristate.

Specimens examined: *Charles Noyes Forbes* 507-*L*, Maunalei Gulch, Isl. Lanai, Hawaiian Isls., September, 1917 (3 type sheets, Field).

Lipochaeta lavarum conferta var. nov.

Plus minusve ramosa, foliis ad ramulorum bases congregatis, linearibus, utrinque attenuatis, margine subintegris integrisve, utrinque canescentibus, petiolo tenui 3–9 mm. longo adjecto secundariis subnumerosis 3–5 cm. longis et 4–7 mm. latis. Capitula pansa ad anthesin 2–3.5 cm. lata et 7–8 mm. alta. Achaenia fimbriato-coronata et plerumque aristata.

More or less branched; leaves congregated at bases of branchlets, linear, at both ends attenuate, subentire or entire, on both surfaces canescent, the subnumerous secondary ones 3–5 cm. long including the slender petiole (this 3–9 mm. long) and 4–7 mm. wide. Capitula 2–3.5 cm. wide when expanded at anthesis and 7–8 mm. tall. Achenes fimbriate-crowned and commonly aristate.

Specimens examined: *Horace Mann & William T. Brigham* 358, Isl. Lanai, Hawaiian Isls. (type, Field).

Lipochaeta lavarum maneleana var. nov.

Caules simplices ramosive, internodiis saepius elongatis; foliis primariis oblonge oblanceolatis, apice saepius subobtusis, basi in petiolum tenuem 0.5–2 cm. longum cuneate sensimque angustatis, margine serrulatis, utrinque canescentibus, longitudinaliter 1-nerviis, penninerviis, petiolo adjecto 5–6.5 cm. longis et 7–9 mm. latis. Capitula pansa ad anthesin sub 2 cm. lata et ±5 mm. alta. Achaenia apice pulverulento centraliter plerumque aristata sed ad circuitum saepius 1–7-appendiculata.

Stems simple or branched, internodes more often elongate; primary leaves oblong-oblanceolate, at apex more often subobtuse, at base gradually and cuneately narrowed into a slender petiole 0.5–2 cm. long, at margin serrulate, on both surfaces canescent, lengthwise 1-nerved, penninerved, 5–6.5 cm. long including petiole and 7–9 mm. wide. Capitula under 2 cm. wide when expanded at anthesis and ±5 mm. tall. Achenes commonly aristate at center of the pulverulent apex but more often only 1–7-appendiculate at its circumference.

Specimens examined: *Charles Noyes Forbes* 288–*L*, on slopes above Manele, Isl. Lanai, Hawaiian Isls., June, 1913 (2 type sheets, Field).

The type material somewhat resembles in general habit the typical *L. lavarum* of Maui and elsewhere and had been considered by me some years ago as connecting the bulk of Lanai material with the species proper. A re-examination shows, however, that it differs at once in the absence of two well developed lateral leaf-veins (which if present would give the characteristic triple-nerved leaves so common in *L. lavarum* proper) and in its lack of a definite fimbriate coronula near the centers of the achenial apices. It is likely, too, that the flowering heads are consistently smaller. In the species proper, they measure 1.8–2.6 (rarely –3) cm. across, while here the three examined are well under 2 cm. across.

Bidens somaliensis Sherff, Bot. Gaz. 90: 395. 1930; Field Mus. Bot. Ser. 16: 595, *pl. 167*. 1937.

The type of *Bidens somaliensis* was collected by *Domenico Riva*, no. 85, in grassy fields and on plains, from Biddum to Volghe, Somalia, September 15, 1893 (Flor., 2 sheets). This heretofore little-known species has recently been collected again by Miss G. A. Chambers, in the rather remote Bukoba Province of northwestern Tanganyika Territory: no. *K*52, "largely growing in country which reminded me of Alpine meadows," alt. 6,000 feet, Bugufi, January, 1936 (Kew); no. *K*55, with identical data. Like the two type specimens, these differ from the somewhat similar *Bidens ruandensis* Sherff of the region (Ruanda) immediately west of Bukoba, in having the upper leaves lanceolate or broader (not linear), foliar teeth antrorse or spreading (not incurved), exterior involucral bracts equaling or shorter than (not longer than) the interior, etc. (It may be noted here that the leaves of *B. somaliensis* were originally described somewhat misleadingly as "non manifeste petiolata," with the qualification that they were "inferne sensim ad basim . . . angustata." In the case of the lower and even some median leaves, the cuneately narrowed basal portion of the *lamina* ends in what amounts to an alate-margined petiole 1–4 cm. long.)

Collected by Miss Chambers at the same place and time with her *K*52 and *K*55 was a third specimen, no. *K*21 (Kew). This was from a robust plant probably a meter or more tall, and erectly well branched at the subcorymbose, 9-capitulate inflorescence. The uppermost leaves, to be sure, are essentially linear, as for *B. ruandensis*, but the characters of the median leaves reveal a closer affinity with *B. somaliensis*, of which Miss Chambers' plant (*K*21) may be taken as representing a new variety:

Bidens somaliensis bukobensis var. nov.

Folia mediana angustiora, sub 1.8 cm. lata, utrinque attenuata sed apice subobtusa, utroque latere irregulariter tantum 1–3-dentata vel superiora integra. Achaenia breviora, sub 1 mm. longa.

Median leaves narrower, under 1.8 cm. wide, at both ends attenuate but subobtuse at apex, on each side irregularly only 1–3-dentate or the upper ones entire. Achenes shorter, under 1 mm. long.

Bidens Steppia var. Elskensii Sherff, Bull. Jard. Bot. Brux. 13: 286. 1935; Field Mus. Bot. Ser. 16: 545. 1937.

The type of this variety was collected by O. Elskens, no. 257, in places long cultivated, hills at Kitega, Ruanda, tropical east Africa, December 13, 1922 (Bruss.). Its achenes measured 1.1–1.3 mm. wide. Recently the variety has been collected once again, in a region not far east of Ruanda: *Romola D. Bax* 204, near Shinyanga, northern Tanganyika Territory, 1932–1933 (Kew).[1] This latter specimen, consisting of three fine flowering and fruiting sprays mounted on a single sheet, is close to the type (of which I have my large photograph before me) but differs in having somewhat narrower achenes, these measuring only 0.8–1 mm. wide.

Bidens Schimperi brachycera var. nov.

Herba annua ±4.5 dm. alta. Folia principalia 5- vel 7-partita petiolo usque ad 4.5 cm. longo, petiolo adjecto majora ±1.8 dm. longa, foliolis moderate vel sublate lanceolatis, imis interdum breviter (2–5 mm.) petiolulatis usque ad 7 cm. longis et 4 cm. latis plus minusve 3–5-partitis (lobis lateralibus parvis ovatis ±1 cm. longis). Capitula pansa ad anthesin 2–4.5 cm. lata, involucri bracteis exterioribus usque ad 2 cm. longis et 2.8 mm. latis, floribus ligulatis etiam usque ad 2.3 cm. longis. Achaenia minora tantum circ. 5–6 mm. longa et supra 1–1.3 mm. lata, inferne sensim plus minusve angustata; aristis minimis sub 0.2 mm. longis, nudis.

Annual herb ±4.5 dm. tall. Principal leaves 5- or 7-parted, with petiole included (this up to 4.5 cm. long) the larger ones ±1.8 dm. long; leaflets moderately or rather widely lanceolate, lowermost ones sometimes shortly (2–5 mm.) petiolulate up to 7 cm. long and 4 cm. wide and more or less 3–5-parted (their lateral lobes small, ovate, ±1 cm. long). Capitula 2–4.5 cm. wide when expanded at anthesis; exterior involucral bracts up to 2 cm. long and 2.8 mm. wide; ligulate florets even up to 2.3 cm. long. Achenes smaller, only about 5–6 mm. long and near top 1–1.3 mm. wide, gradually more or less narrowed downwardly; aristae very small, under 0.2 mm. long, nude.

Specimens examined: *Romola D. Bax* 203, growing 2–3.5 feet tall, in long grass, Shinyanga, northern Tanganyika Territory, March, 1933 (Kew); *Bax* 206, growing 1.5 feet tall, in grass, Shinyanga, May, 1933 (type, Kew).

Bidens Schimperi Schz. Bip., as might be surmised from the several synonyms which have been created for it, is a polymorphous species, especially so as to leaf-outline and size of achenes. The species proper normally has the outer achenes with bodies ranging up to 9–12 (–14) mm. long and 2–2.6 mm. wide, and inner achenes with bodies up to 1.6 cm. long and about 2 mm. wide. Cultivated specimens sometimes have inner achenes with bodies 2.2 cm. long. Var. *leptocera* Sherff differs as to achenes in having the bodies only 3–5 mm. long, also the aristae exceedingly slender and 1.5–3 (not 2.5–4) mm. long. Var. *brachycera* differs at once from both in having achenes almost exaristate, the aristae being mere rudiments less than 0.2 mm. long and without barbs. From var. *leptocera*, var. *brachycera* may be recognized instantly by its moderately to almost broadly lanceolate, not linear to linear-lanceolate, leaf-divisions.

---

[1] Shinyanga is about 100 kilometers south of the southeast coast of Lake Victoria. *Bax* 203 (Kew) was collected in March, 1933, and *Bax* 206 (Kew) in May, 1933, but the month is not given for *Bax* 204.

Bidens Schimperi leiocera var. nov.

Folia bipinnata vel tripinnatisecta, petiolo gracili usque ad 5 cm. longo, rhachi exalata vel terminaliter subalata, petiolo adjecto ±1.5 dm. longa. Capitula pansa ad anthesin 3–4 cm. lata, disco circ. 1.2 cm. lata. Ovaria faciebus marginibusque glabra apice fimbriato-setoso biaristata aristis tenuibus acribus nudis ±2.5 mm. longis.

Leaves bipinnate or tripinnatisect, including the slender (and up to 5 cm. long) petiole ±1.5 dm. long, rachis exalate or terminally subalate. Capitula 3–4 cm. wide when expanded at anthesis, disc about 1.2 cm. wide. Ovaries glabrous on faces and margins, at top fimbriate-setose and biaristate; aristae slender, sharp, nude, ±2.5 mm. long.

Specimens examined: *J. D. Martin*, Mazabuka, northern Rhodesia (type, Kew).

The type had been determined at Kew as *Coreopsis Steppia* Steetz (*Bidens Steppia* mihi), perhaps because of the rather long ray-florets, these giving the flowering heads a width of 3–4 cm. In characters of the leaves (nature of pubescence, texture, presence of numerous glandular dots, kind of dissection, outlines of segments, etc.), in nature of involucre, in size of disc, etc., the affinities are seen at once to be with *Bidens Schimperi* Schz. Bip.

Bidens Snowdenii sp. nov.

Herba annua, ±5 dm. alta; caule tetragono, purpurascenti, glabro, superne ramoso, ramis sparsim hispidis. Folia primaria absentia; secundaria tenuiter petiolata petiolis ciliatis aliter saepe glabratis 5–13 mm. longis, petiolo adjecto sub 3.5 cm. longa et sub 2 cm. lata, pinnatim 3–5-partita segmentis plus minusve rhomboide ovatis lanceolatisve acriter saepe subincise paucidentatis membranaceis hispidis plus minusve petiolulatis saepius 5–12 mm. longis. Capitula moderate numerosa (±25), subcorymbose disposita, radi-

ata, pansa ad anthesin 2–2.5 cm. lata et 7–8 mm. alta, graciliter pedunculata pedunculis sparsim hispidis usque ad 5.5 cm. longis, disco demum circ. 1.2 cm. lato. Involucri bracteae 2-seriales subaequales, exteriores 8–10 lineari-lanceolatae hispidae apice saepius acutae demum reflexae 5–6 mm. longae et 1–1.4 mm. latae; interiores late oblongo-lanceolatae, plus minusve glabratae. Flores ligulati 8–10, flavi, ligula lineari-oblongi, ±1 cm. longi. Paleae lanceolatae vel oblongae, infra saepe late diaphano-marginatae, sub 8 mm. longae. Achaenia anguste vel late oblongo-linearia vel interdum subcuneata, exalata, facie ventrali plana dorsali angulato-convexa, utraque facie circ. 8-sulculata et superne erecto-setosa, plumbeo-nigra, marginibus infra breviter supra longius erecto-setosa, apice erecte setosa setis in cristam coronamve membranaceam coalitis etiam biaristata aristis gracilibus 1–2.2 mm. longis antrorsum hispidulis.

Annual herb, ±5 dm. tall; stem tetragonal, becoming purplish, glabrous, branched above, the branches sparsely hispid. Primary leaves absent; secondary ones slenderly petiolate (the ciliate but otherwise often glabrate petioles 5–13 mm. long), under 3.5 cm. long with petiole included and under 2 cm. wide, pinnately 3–5-parted; segments more or less rhomboidally ovate or lanceolate, sharply often incisedly few-dentate, membranaceous, hispid, more or less petiolulate, more often 5–12 mm. long. Capitula moderately numerous (±25), subcorymbosely disposed, radiate, 2–2.5 cm. wide when expanded at anthesis and 7–8 mm.tall, slenderly pedunculate with the sparsely hispid peduncles up to 5.5 cm. long, disc finally about 1.2 cm. wide. Involucral bracts 2-seriate, subequal; exterior ones 8–10, linear-lanceolate, hispid, at apex more often acute, finally reflexed, 5–6 mm. long and 1–1.4 mm. wide; interior ones widely oblong-lanceolate, more or less glabrate. Ligulate florets 8–10, yellow, ±1 cm. long, the ligule linear-oblong. Paleae lanceolate or oblong, often widely diaphanous-margined below, under 8 mm. long. Achenes narrowly or widely oblong-linear or sometimes subcuneate, exalate, ventrally flat but dorsally angulate-convex, on each face about 8-sulculate and toward top erectly setose, leaden-black, at margins shortly erect-setose below but more elongately so above, at apex erect-setose with setae coalesced into a membranaceous crest or crown, also biaristate; aristae slender, 1–2.2 mm. long, antrorsely hispidulous.

Specimens examined: *J. D. Snowden* 1,631, growing 1–2 feet tall, occasional in short-grass land, alt. 7,000 feet, "Kigezi: Mabungo," Uganda, Kenya Colony, October 25, 1929 (type, Kew).

In the key given in my monograph on *Bidens* (Field Mus. Bot. Ser. 16. 1937), *B. Snowdenii* goes to the first letter *e* on page 62. As to length of ligulate florets, it goes to the first letter *f* thereunder, but may be separated at once from the two species there given by its antrorsely hispidulous not, as in *B. Schimperi*, retrorsely barbed achenial aristae, or by the even or unbroken not (as in *B. Onisciformis*) pectinate-dentate or lacerate margins of the exterior achenes. From the nature of its achenes, with their apical setae somewhat coalesced below into a small, diaphanous cup or crown, *B. Snowdenii* is seen to stand near *B. Grantii* (Oliv.) Sherff.

Bidens imatongensis sp. nov.

Herba perennis, ramosa, valida, usque ad 2.4 m. alta; ramis sulcatis subangulatis sparsim vel apices versus dense hispidis. Folia opposita, breviter alato-petiolata, pinnatim ±5-partita (unicum principale paulum mancum visum); foliolis lateralibus inferioribus lanceolato-ovatis, petiolulatis petiolulo late alato ±1 cm. longo, grosse acriterque dentatis (dentibus saepe duplicibus triplicibusve subantrorsis apice calloso-mucronulatis), apice attenuatis, membranaceis, supra subsparsim infra moderate vel ad venas dense pilis multiloculatis hispidis, usque ad 9.5 cm. longis et 5 cm. latis; lateralibus superioribus similibus sed paulo minoribus et basi sessili ad rhachin late decurrentibus; terminali angustiore. Capitula ±4-congregata, subrobuste pedunculata pedunculo dense patenti-hispido 1–7 cm. longo, radiata, pansa ad anthesin ±5 cm. lata et ±1.5 cm. alta, disco demum 2–2.5 cm. lato et circ. 1.5 cm. alto. Involucri hispidi bracteae 2- vel sub-3-seriales lanceolatae extimae circ. 10–12 patentes reflexaeve 8–15 mm. longae quam aliae paulo nunc breviores nunc longiores. Flores ligulati ±12, flavi, ligula anguste oblongo-obovati, apice plus minusve integri ±2.5 cm. longi. Paleae oblonge lineares, apice colorato subacutae vel acutae, usque ad 1.4 cm. longae. Achaenia submatura plana, cuneate angusteque lineari-oblonga, atro-brunnea, utraque facie circ. 8-sulculata et glabra vel supra sparsissime setosa, apice marginibusque erecte setosa, corpore 4–6 mm. longa et 1.1–1.4 mm. lata, exalata, biaristata aristis gracilibus acribus ±2 mm. longis maxima pro parte nudis sed plerumque ad basim raro ad apicem antrorso-setosis.

Perennial herb, branched, robust, up to 2.4 meters tall; branches grooved, subangulate, sparsely or toward their tips densely hispid. Leaves opposite, shortly wing-petioled, pinnately ±5-parted (a lone, somewhat imperfect principal leaf seen); lower lateral leaflets lanceolate-ovate, petiolulate with a widely winged petiolule ±1 cm. long, coarsely and sharply dentate (teeth often double or triple, subantrorse, apically indurate-mucronulate), at apex attenuate, membranaceous, above subsparsely below moderately or at the veins densely hispid with multiloculate hairs, up to 9.5 cm. long and 5 cm. wide; upper lateral leaflets similar but somewhat smaller and at their sessile base widely decurrent upon the rachis; terminal leaflet narrower. Capitula ±4 to an inflorescence, subrobustly pedunculate with a peduncle densely spreading-hispid and 1–7 cm. long, radiate, ±5 cm. wide when expanded at anthesis and ±1.5 cm. tall, disc finally 2–2.5 cm. wide and about 1.5 cm. tall. Involucre hispid, its bracts 2- or sub-3-seriate and lanceolate; outermost ones about 10–12, spreading or reflexed, 8–15 mm. long; the others now a little longer now a little shorter. Ligulate florets ±12, yellow, with narrowly oblong-obovate ligule, at apex more or less entire, ±2.5 cm. long. Paleae oblong-linear, subacute or acute at the colored apex, up to 1.4 cm. long. Achenes submature, flat, cuneately and narrowly linear-oblong, blackish-brown, on each face about 8-sulculate and glabrous or toward top very sparsely setose, at apex and margins erectly setose, exalate, as to body 4–6 mm. long and 1.1–1.4 mm. wide, biaristate; aristae slender, sharp, ±2 mm. long, for the most part nude but commonly at base and rarely at apex antrorsely setose.

Specimens examined: *W. J. Eggeling* 1,195 (field no. 820), large, branched herb, growing up to 8 feet tall, alt. 6,500 feet, Imatong Mountains, Uganda, Kenya Colony (type, Kew).

In the key given in my monograph on *Bidens* (Field Mus. Bot. Ser. 16. 1937), *B. imatongensis* might go at times to *B. magnifolia* (first letter *i* on page 69) but doubtless more often would go to near *B. Crataegifolia* and *B. kamerunensis* (both under the second letter *n* on page 70). From *B. magnifolia* it differs in having short, winged leaf-petioles; not or at most very inconspicuously glandular-punctulate leaf-blades; peduncles spreading-hispid, not glabrate; mostly larger, more spreading, more or less 3-seriate involucral bracts; about 12 not 8–10 ligulate florets, etc. From *B. Crataegifolia* it differs in having shorter leaf-petioles (±1 not 2–3 cm. long); leaf-blades pinnately ±5-parted, the larger ones ±2 dm. wide, not simple or subsimple and 2.5–3.5 cm. wide; ligulate florets about 12, not about 8; achenial aristae slender and ±2 mm. long, not thickish below and about 0.5 mm. long, etc. From *B. kamerunensis* it differs in having lateral leaflets of larger leaves up to 9.5 cm. long and 5 cm. wide, not up to 2.5 cm. long and about 1 cm. wide; achenial body (when mature) probably little more than 6 mm. long and 1.4 mm.

wide, not about 11–13 mm. long and 2 mm. wide; achenial apex consistently biaristate with slender aristae mostly about 2 mm. long, not exaristate or at most comparatively short-aristate with aristae under 1.5 mm. long, etc.

Bidens Lynesii sp. nov.

Perennis, fruticosa vel subfruticosa, ramosa, usque ad 2.7 m. alta; ramis tetragonis, glabris, siccis purpureo-nigris; ultimis gracilibus, saepius 0.7–2 mm. crassis, superne plus minusve hispidulis. Folia opposita, petiolata petiolis tenuibus patenti-hispidis usque ad ±3.5 cm. longis, petiolo adjecto 6–11 cm. longa, pinnatim 3–5-partita, demum insigniter membranacea, supra non nisi secundum venas hispidula, infra pallidiora saepe numerose atro-punctulata et praecipue secundum venas hispida pilis multiloculatis; foliolis ovatis vel terminali lanceolato, acriter subdupliciterque serratis (dentibus mucronatis), lateralibus obtusis acutisve usque ad 2.5 cm. longis et 1.5 cm. latis, rhachi alata, terminali acuto attenuatove. Capitula solitaria vel pauca ad ramulorum apices disposita, radiata, pansa ad anthesin 3.5–4.5 cm. lata et ±1 cm. alta; pedunculo gracili usque ad 5.5 cm. longo. Involucri bracteae biseriales, exteriores circ. 8, oblongo-spathulatae vel obovato-oblongae, irregulariter hispidae pilis multiloculatis, circ. 5-nervatae, apice acutae vel subobtusae, circ. 6–7 mm. longae; interiores paulo longiores, moderate hispidulae, ovato-lanceolatae. Flores ligulati circ. 8, flavi, ligula anguste oblanceolato-oblongae, apice subintegri, 1.6–2.2 cm. longae. Paleae lineari-oblongae, 6–7 mm. longae. Achaenia submatura valde obcompressa, anguste oblonga, nigra, utraque facie ±8-sulculata et glabra vel apicem versus paucisetosa, exalata sed apice marginibusque erecto-setosa setis stramineis et inferne plus minusve alato-connatis, corpore ±4.5 mm. longa et ±1.4 mm. lata, biaristata aristis tenuissimis acribus circ. 3.5–4 mm. longis nudis vel raro antrorso-hamosa unico hamo.

Perennial, fruticose or suffruticose, branched, up to 2.7 meters tall; branches tetragonal, glabrous, purplish-black when dry; ultimate branches slender, more often 0.7–2 mm. thick, more or less hispidulous above. Leaves opposite, petiolate, 6–11 cm. long including petiole, pinnately 3–5-parted, finally very membranaceous, glabrous on upper surface unless hispidulous along veins, on paler lower surface often numerously dark-punctulate and especially along veins hispid with multilocular hairs; leaflets ovate or terminal one lanceolate, sharply and somewhat doubly serrate with mucronately tipped teeth, lateral ones obtuse or acute and up to 2.5 cm. long by

1.5 cm. wide, rachis winged, terminal leaflet acute or attenuate at apex; petiole slender, spreading-hispid, up to ±3.5 cm. long. Capitula solitary or few at the ends of the branches, radiate, 3.5–4.5 cm. wide when expanded at anthesis and ±1 cm. tall; peduncle slender, up to 5.5 cm. long. Involucral bracts in two series; exterior about 8, oblong-spatulate or obovate-oblong, irregularly hispid with multilocular hairs, about 5-nerved, at apex acute or subobtuse, about 6–7 mm. long; interior a little longer, moderately hispidulous, ovate-lanceolate. Ligulate florets about 8, yellow, with narrowly oblanceolate-oblong ligule, at apex subentire, 1.6–2.2 cm. long. Paleae linear-oblong, 6–7 mm. long. Achenes submature, strongly obcompressed, narrowly oblong, black, on each face ±8-sulculate and glabrous or toward apex few-setose, exalate but at margins and apex erect-setose with straw-colored and infernally more or less alate-connate setae, as to body ±4.5 mm. long and ±1.4 mm. wide, biaristate; aristae very slender, sharp, about 3.5–4 mm. long, naked or rarely antrorse-barbed with a single barb.

Specimens examined: *Rear-Admiral Hubert Lynes* (Dabaga no.) 4, growing into a bush up to 9 feet tall at edges of groves, Dabaga, Tanganyika Territory, February 5, 1932 (type, Kew).

The aspect of the four sprays mounted upon the type sheet is singularly like that of many Hawaiian Island species of the section *Campylotheca* (Cass.) Nutt. The species is seen from its achenes, however, to belong, as all other forms of *Bidens* newly described in this paper, in the section *Psilocarpaea* DC. In the key given in my monograph on *Bidens* (Field Mus. Bot. Ser. 16. 1937), *B. Lynesii* would go very definitely to the first letter *m* on page 70. From *B. phelloptera* given there it differs widely, however, in having its exterior involucral bracts hispid and upwardly dilated, its interior involucral bracts not connate below, its mature inner achenial bodies surely never 8–9 mm. long, etc.

Bidens insignis sp. nov.

Herba perennis, ±1.5 m. alta; caulibus pluribus congregatis, forsitan non ramosis, tetragonis, glabris, sulculatis et plus minusve purpureo-striatis. Folia opposita, petiolata, supra moderate infra dense hispida; inferiora vel principalia magna, petiolis circ. 4.5–5 cm. longis, lamina circumambitu deltoideo-ovata ±11 cm. longa et 9–14.5 cm. lata rhachi plus minusve alata foliolis lateralibus 3 vel 4 paribus (ovato-lanceolatis, 2.5–7.5 cm. longis et 1.5–3 cm. latis, apice acutis vel attenuatis, crenato-serratis et saepe incise 1–3-lobulatis, secundum

rhachin decurrentibus) terminali (pro unico folio viso et forsitan non typico) breviore rhomboideo utrinque latissime cuneato; superiora minora, petiolis 2–3.5 cm. longis, lamina 6–7 cm. longa et ±7 cm. lata, foliolis lateralibus 1 pare lanceolatis vel ovato-lanceolatis simplicibus terminali rhomboideo subtripartito segmentis plus minusve attenuatis. Capitula corymbose disposita, radiata, pansa ad anthesin ±8 cm. lata et ±1.3 cm. alta, disco 1.5 2 cm. lato, pedicellis ±1 cm. longis et (ut inflorescentiae ramis) patenti-hispidis. Involucri bracteae hispidae 2–3-seriales exteriores 8–10 lineares vel lanceolatae 6–8 mm. longae interiores lanceolatae ±1 cm. longae. Flores ligulati probabiliter 12–14, flavi, ligula oblongi vel obovato-oblongi, apice vix denticulati, 3–4 cm. longi et usque ad 1.1 cm. lati. Paleae lineares, 7–10 mm. longae. Achaenia submatura plana, exalata, utraque facie circ. 8-sulculata et glabra vel paulum erecto-hispidula, brunneo-atra, marginibus apiceque erecto-setosa, biaristata aristis 1.5–2.5 mm. longis nudis vel raro basin versus antrorsum 1-hamosis.

Perennial herb, ±1.5 meters tall; stems clumped many together, possibly simple, tetragonal, glabrous, sulculate and more or less purple-striate. Leaves opposite, petiolate, above moderately below densely hispid; lower or principal ones large, petioles about 4.5–5 cm. long, blade deltoid-ovate in outline and ±11 cm. long by 9–14.5 cm. wide, rachis more or less alate, lateral leaflets 3 or 4 pairs (ovate-lanceolate, 2.5–7.5 cm. long and 1.5–3 cm. wide, at apex acute or attenuate, crenate-serrate and often incisedly 1–3-lobulate, decurrent along the rachis), terminal leaflet (this seen for a single leaf and perhaps not typical) shorter, rhomboid, at both ends very widely cuneate; upper leaves smaller, petioles 2–3.5 cm. long, blade 6–7 cm. long and ±7 cm. wide, lateral leaflets a single pair (these lanceolate or ovate-lanceolate, simple), terminal leaflet rhomboid, subtripartite, its segments more or less attenuate. Capitula corymbosely disposed, radiate, ±8 cm. wide when expanded at anthesis and ±1.3 cm. tall, disc 1.5–2 cm. wide, pedicels ±1 cm. long and (like branches of inflorescence) spreading-hispid. Involucral bracts hispid, 2–3-seriate, the 8–10 outer ones linear or lanceolate and 6–8 mm. long, inner ones lanceolate and ±1 cm. long. Ligulate florets probably 12–14, yellow, with oblong or obovate-oblong ligule, at apex scarcely denticulate, 3–4 cm. long and up to 1.1 cm. wide. Paleae linear, 7–10 mm. long. Achenes submature, flat, exalate, on each face about 8-sulculate and glabrous or somewhat erect-hispidulous, brownish-black, at margins and top erect-setose, biaristae; aristae 1.5–2.5 mm. long, naked or rarely armed toward base with an erect barb.

Specimens examined: *Mrs. Brodhurst-Hill* 612, a very handsome plant, growing in large clumps, 5 feet tall, alt. about 7,000 feet, Menengai, Kenya Colony (type, Kew).

Rather noteworthy as combining in one species such large lower leaves, glabrous and purple-striate stems, comparatively small exterior involucral bracts, and large flowering-heads. In the key given in my monograph on *Bidens* (Field Mus. Bot. Ser. 16. 1937), *B. insignis* would stand next to *B. magnifolia* on page 69. From that species it differs at once in having only the lower leaves large (these even then being less attenuate-tipped, rather thickish, less sharply serrate, and lacking blackish, glandular dots), peduncles or pedicels much shorter, flowering heads broader, ligulate florets longer and more numerous, achenial aristae nude, etc.

In its lower or larger leaves it may faintly approach the upper leaves of *Coreopsis pinnatipartita* O. Hoffm., from which it differs in lacking glabrous, alate, exaristate achenes, etc.

Bidens nobilis sp. nov.

Frutex ramosus 1.8–3.6 m. altus, ramis tetragonis sulculatis demum atro-purpurascentibus glabris gracilibus unico viso tantum 1–2 mm. crasso. Folia opposita glaberrima etiam eciliata tenuiter petiolata petiolis vix submarginatis usque ad 1.5 cm. longis, petiolo adjecto 4–6.5 cm. longa, circumambitu deltoideo-ovata, bipinnatisecta, foliolis plerumque 5, terminali inferioribusque saepius 5-partitis medianis circ. 3-partitis (segmentis lineari-oblongis, membranaceis, saepius 2–3.5 mm. latis, apice mucronatis, rhachin marginatam simulantibus). Capitula (unicum visa) solitaria, pedunculum gracilem sparsim patenti-hispidum ±3 cm. longum terminantia, pansa ad anthesin ±6 cm. lata et ±1.2 cm. alta, disco ±1.3 cm. lato. Involucrum (unicum visum) late depresso-campanulatum; bracteis exterioribus ±8, lineari-lanceolatis, apice vix acutis, faciebus subsparsim hispidulis, 6–9 mm. longis; interioribus late oblongo-lanceolatis, margine diaphano flavidis, alibi purpureo-brunneis, tergo glabratis, apice puberulentis, circ. 8–9.5 mm. altis. Flores ligulati ±8, flavi, ligula plus minusve lanceolato-oblongi, apice subintegri, circ. 2.5 cm. longi. Paleae lineares, glabrae vel glabratae, infra stramineae, supra coloratae, 7–8.5 mm. longae et sub 1 mm. latae. Styli rami pro floribus tubulosis sensim vel subabrupte caudati. Achaenia matura ignota. Ovaria vel achaenia immatura plana, exalata, atro-brunnea, utraque facie glaberrima etiam circ. 8-sulculata et mediane plus minusve costata, apice marginibusque erecto-setosa, corpore

2.5–3.5 mm. longa et circ. 1 mm. lata, biaristata aristis suberectis acribus nudis 1–1.5 mm. longis.

Shrub, branched, 1.8–3.6 meters tall; branches tetragonal, sulculate, finally blackish-purple, glabrous, slender, (the single one seen) only 1–2 mm. thick. Leaves opposite, very glabrous, even eciliate, slenderly petiolate, 4–6.5 cm. long including petiole, deltoid-ovate in outline, bipinnatisect; leaflets commonly 5, terminal and lower ones more often 5-parted, median ones about 3-parted (segments linear-oblong, membranaceous, more often 2–3.5 mm. wide, at apex mucronate, simulating the winged rachis); petiole scarcely submargined, up to 1.5 cm. long. Capitula (a single one seen) solitary, terminating the slender, sparsely spreading-hispid, and ±3 cm. long peduncle, ±6 cm. wide when expanded at anthesis and ±1.2 cm. tall, the disc ±1.3 cm. wide. Involucre (only one seen) broadly depressed-campanulate; outer bracts ±8, linear-lanceolate, at apex scarcely acute, on faces subsparsely hispidulous, 6–9 mm. long; inner bracts widely oblong-lanceolate, yellow on the diaphanous margin, elsewhere purple-brown, dorsally glabrate, apically puberulent, about 8–9.5 mm. tall. Ligulate florets ±8, yellow, with more or less lanceolate-oblong ligule, at apex subentire, about 2.5 cm. long. Paleae linear, glabrous or glabrate, straw-colored below, otherwise colored above, 7–8.5 mm. long and less than 1 mm. wide. Style-branches gradually or subabruptly caudate. Mature achenes unknown. Ovaries or immature achenes flat, wingless, blackish-brown, on each surface very glabrous also about 8-sulculate and medianly more or less costate, at apex and margins erect-setose, as to body about 2.5–3.5 mm. long and about 1 mm. wide, biaristate; aristae suberect, sharp, nude, 1–1.5 mm. long.

Specimens examined: *C. Gilbert Rogers* 133, a strong-growing, branched shrub 6–12 feet tall, in lower part of open scrub-forest zone, alt. 7,300 feet, Kimengalia Stream, above Rongai, north slopes of Mount Kilimanjaro, Tanganyika Territory, December 1, 1932 (type, Kew).

In the key presented in my monograph on *Bidens* (Field Mus. Bot. Ser. 16. 1937), this species would stand under the second letter *i* at the bottom of page 68. From the four species there listed it may be immediately distinguished as follows: from *B. Elliotii* in having leaves (petiole included) 4–6.5 not mostly 6–10 or even –17 cm. long, their leaflets comparatively wider and much less elongate-linear; from *B. Taylori* in having flowering-heads much wider than 2–2.5 cm.; from *B. Schlechteri* in having heads at anthesis ±6 not 3–4.5 cm. wide, branches leafy up to the short (±3 cm. long) peduncles, not subnude toward the often elongate (up to 16 cm. long) peduncles, terminal leaf-lobe commonly 6–15 mm. long past its lateral lobules or teeth, not 2–5 cm.; from *B. kivuensis* in being glabrous and in having biaristate ovaries.

Bidens taitensis Sherff, Bot. Gaz. 90: 396. 1930; Field Mus. Bot. Ser. 16: 552, *pl. 141*. 1937.

Bidens taitensis was founded upon a single specimen collected by J. M. Hildebrandt, no. 2,432*a*, at altitude of 600–900 meters, Taita (Teita) Mountains, Kenya Colony, February, 1877 (Berl.). Apparently Hildebrandt had found only the one plant growing. The type description was necessarily somewhat incomplete. More recently a lone additional specimen of this seemingly rare species has been collected: *Miss E. R. Napier* 1,321, an herb 3–6 feet tall, only one plant seen, growing on hillside in association with *Vernonia* sp. and scrub, alt. 4,500 feet, Wusi, Taita Hills, Kenya Colony, June 17, 1931 (Kew). My original description may now be amplified as follows: Height 0.9–1.8 meters. Flowering heads (a single one seen) ±5 cm. wide. Exterior involucral bracts at times mostly ovate-oblong. Ligulate florets 8.

Bidens Hoffmannii angustata var. nov.

Foliorum segmenta involuta plerumque tantum 0.3–0.6 mm. lata. Capitula pansa ad anthesin sub 2 cm. lata. Involucri bracteae exteriores saepius 8, tergo non nisi ad basim hispidae sed marginibus praecipue inferne longo-ciliatae.

Leaf-segments involute, commonly only 0.3–0.6 mm. wide. Capitula less than 2 cm. across when expanded at anthesis. Exterior involucral bracts more often 8, dorsally not hispid unless at base but long-ciliate on margins especially below.

Specimens examined: *Mrs. Brodhurst-Hill* 215, growing 2.5 feet tall, in big, spreading clumps along the sides of the Turbo-Soy roads, in very poor soil and murram, Kenya Colony (type, Kew).

Bidens Bequaertii amplior var. nov.

Folia majora, principalia ±1 dm. longa, foliolis minus patentibus segmentis angustioribus ±1 mm. latis. Flores ligulati numerosiori 7 vel 8. Achaenia centralia superne arcuata ±1.5 cm. longa, aristis 2 probabiliter numquam 3.

Leaves larger, principal ones ±1 dm. long; leaflets less spreading; their segments narrower, ±1 mm. wide. Ligulate florets more

numerous, 7 or 8. Central achenes curved above, ±1.5 cm. long; aristae 2 and probably never 3.

Specimens examined: *Rear-Admiral H. Lynes* no. *I.h.* 263*a*, alt. 6,200–6,400 feet, Mt. Mferu, Iringa, central Tanganyika Territory, March 22, 1932 (type, Kew).

Bidens dolosa sp. nov.

Herba perennis usque ad 2.4 m. alta, caule subtereti sulculato glabrato vel superne subglanduloso-pubescenti. Folia opposita anguste petiolata petiolis usque ad 5 cm. longis, petiolo adjecto ±1.7 dm. longa; lamina circumambitu deltoideo-ovata, pinnatim 5–7-partita, foliolis membranaceis plerumque eciliatis, acriter serrata dentibus pro utroque latere saepius 20–30, supra glabratis, infra praecipue secundum venas brunneo-tomentosis, lanceolatis, apice plus minusve attenuatis, basi sessilibus, medianis superioribusque alato-decurrentibus, plerumque 4–7 cm. longis et 1.5–2.2 cm. latis, terminali plus minusve imperfecte tripartito. Capitula corymbose disposita (unica inflorescentia visa ±11-capitulata circ. 1.5 dm. lata et sub 1 dm. alta), radiata, circ. 4 cm. lata et circ. 1 cm. alta, graciliter pedicellata pedicellis glanduloso-pubescentibus plerumque sub 3 cm. longis. Involucri bracteae subaequales exteriores 6–8, lanceolato-lineares, intus vix extus plus minusve dense adpresso-hispidulae, longitudinaliter 3- vel sub-5-nervatae, ±7 mm. longae; interiores latiores, extus margine lato excepto adpresso-hispidulae. Flores ligulati 6–8, flavi, 1.5–2 cm. longi, ligula anguste vel moderate elliptico-oblongi, apice angustata et vix vel non denticulati. Flores tubulosi interdum 4- plerumque 5-dentati, paleas lineari-oblongas late marginatas apice obtusas plerumque superantes. Styli rami abrupte caudati. Achaenia matura ignota. Ovaria plana, oblonga vel subcuneato-oblonga, faciebus non nisi apicem versus pubescentia, marginibus apiceque erecto-hispida, corpore 2–2.5 mm. longa et sub 1 mm. lata, biaristata aristis gracilibus circ. 2 mm. longis, superne paucihamosis hamis superioribus saepius retrorsis aliis erectis.

Perennial herb up to 2.4 meters tall; stem subterete, minutely grooved, glabrate or on upper part subglandular-pubescent. Leaves opposite, narrowly petiolate with petioles up to 5 cm. long, a single leaf ±1.7 dm. long including its petiole; blade deltoid-ovate in outline, pinnately 5–7-parted; leaflets membranaceous, commonly eciliate, sharply serrate with more often 20–30 teeth to each side, glabrate above, brown-tomentose underneath especially along the veins, lanceolate, at apex more or less attenuate, at base sessile,

median and upper ones alate-decurrent, commonly 4–7 cm. long and 1.5–2.2 cm. wide, terminal one more or less imperfectly tripartite. Capitula corymbosely disposed (a lone inflorescence seen, this measuring about 1.5 dm. across and less than 1 dm. tall, and having ±11 capitula), radiate, about 4 cm. wide and about 1 cm. tall, slenderly pedicellate with pedicels glandular-pubescent and commonly under 3 cm. long. Involucral bracts subequal; exterior ones 6–8, lanceolate-linear, slightly appressed-hispidulous within but more or less densely so without, lengthwise 3- or sub-5-nerved, ±7 mm. long; interior ones broader, appressed-hispidulous on outer surface except for the broad margin. Ligulate florets 6–8, yellow, 1.5–2 cm. long; ligule narrowly or moderately elliptic-oblong, at apex narrowed and scarcely or not at all denticulate. Tubular florets at times 4- commonly 5-dentate, surpassing the paleae; these linear-oblong, widely margined, at apex obtuse. Style-branches abruptly caudate. Mature achenes unknown. Ovaries flat, oblong or subcuneate-oblong, glabrous on faces unless toward apex, on margins and at apex erect-hispid, as to body 2–2.5 mm. long and under 1 mm. wide, biaristate; aristae slender, about 2 mm. long, few-barbed above, the upper barbs more often retrorse the others erect.

Specimens examined: *P. J. Greenway* 3,475, perennial herb up to 8 feet tall, forming a dominant in secondary bush in cleared areas in *Myrica-Macaranga-Gymnosporia-Dodonaea* mist forest, common throughout whole area, alt. 6,400 feet, East Mufindi, Iringa Province, Tanganyika Territory, August 3, 1933 (type, Kew).

A plant of the section *Psilocarpaea* DC. In the herbarium it offers a deceiving resemblance in habit (whence the trivial name) to *Bidens rubifolia* H.B.K. of South America, a species differing in having a climbing habit and the very different ovaries (and of course achenes) which characterize the section *Greenmania* Sherff. In the analytical key of my monograph on the genus *Bidens*, *B. dolosa* would stand next to *B. magnifolia* (Field Mus. Bot. Ser. 16: 65. 1937). From *B. magnifolia* it differs decidedly in its scarcely glandular-punctate, never subbipinnatifid leaves, narrower and more finely serrate leaflets, manifestly glandular-pubescent not subglabrous branches of the inflorescence, dorsally hispid involucral bracts, narrower ray-florets, etc.

Bidens Chandleri sp. nov.

Herba perennis, pallida, 1.2–1.4 m. alta, e radice lignea orta. Caulis subsimplex, gracilis, infra obscure supra moderate tetragonus, glaber vel apicem versus paulum hispidulus; internodiis saepius 8–11

cm. longis. Folia opposita vel summa alterna, simplicia, linearia, ad apicem breviter sed basim versus elongate attenuata, marginibus et infra secundum costam medianam hispida vel scabro-subspinulosa alibi glabra vel sparsissime setosa, principalia 8–12 cm. longa et 3–5 mm. lata. Capitula pauca (±3 ad rami apicem) corymbose disposita, graciliter pedunculata pedunculo sparsim hispidulo usque ad 1.2 dm. longo, radiata, pansa ad anthesin 3–4 cm. lata et circ. 1 cm. alta. Involucri basi valde albo-hispidi bracteae subaequales exteriores 6–10, lineari-oblongae, apice obtusae vel rotundae, extus hispidulae, 8–10 mm. longae, nervo mediano rare manifesto; interiores oblongo-ovatae, apice breviter attenuatae, late diaphano-marginatae, extus irregulariter hispidae. Flores ligulati probabiliter 8, subaurantiaci, ligula oblanceolato-oblongi, apice denticulati, 2–2.5 cm. longi. Paleae oblonge lineares, apice obtuso vel triangulato-acuto coloratae, circ. 9–10 mm. longae. Achaenia vix matura obcompresse plana, lineari-oblonga, exalata, brunneo-atra, utrinque circ. 8-sulculata, inferne sparsim superne subsparsim vel marginibus dense setosa setis plus minusve erectis, corpore ±8 mm. longa et ±1.6 mm. lata, apice erecte setoso biaristata aristis saepius moderate patentibus gracilibus stramineis circ. 2 mm. longis nudis vel supra rare unica seta antrorsum barbatis.

Perennial herb, pale, 1.2–1.4 meters tall, from a woody root. Stem subsimple, slender, obscurely quadrangular below but moderately so above, glabrous or toward top somewhat hispidulous; internodes more often 8–11 cm. long. Leaves opposite or the topmost ones alternate, simple, linear, shortly attenuate at apex but elongately so toward base, hispid or scabro-subspinulose at margins and along median rib beneath, elsewhere glabrous or very sparsely setose, principal ones 8–12 cm. long and 3–5 mm. wide. Capitula few (±3 at apex of a branch), corymbosely disposed, slenderly pedunculate with a peduncle sparsely hispidulous and up to 1.2 dm. long, radiate, 3–4 cm. wide when expanded at anthesis and about 1 cm. tall. Involucre strongly white-hispid at base, its bracts subequal; outer ones 6–10, linear-oblong, at apex obtuse or rounded, hispidulous on outer surface, 8–10 mm. long, their median nerve rarely conspicuous; interior ones oblong-ovate, at apex shortly attenuate, widely diaphanous-margined, irregularly hispid on outer surface. Ligulate florets probably 8, somewhat orange-colored, with oblanceolate-oblong ligule, at apex denticulate, 2–2.5 cm. long. Paleae oblong-linear, apically obtuse or triangulate-acute and colored, about 9–10 mm. long. Achenes scarcely mature, obcompressedly flat, linear-

oblong, without wings, brownish-black, about 8-sulculate on each face, more or less erectly setose (below sparsely, above subsparsely or at margins densely so), as to body ±8 mm. long and ±1.6 mm. wide, at apex erectly setose and biaristate; aristae more often moderately spreading, slender, straw-colored, about 2 mm. long, naked or rarely barbed above with a single antrorse seta.

Specimens examined: *Percy Chandler* 939, growing 4 to 4.5 feet tall, alt. 3,600 feet, Sere, Prov. Teso, Uganda, September, 1932 (type, Kew).

An ally of *Bidens Schweinfurthii* Sherff, from which it differs at once in its more delicate habit, in its narrower leaves, and in numerous capitular characters.

Bidens superba brachycarpa var. nov.

A specie ipsa differt: Pedicelli (usque ad 3 cm. longi) forsitan longiores; involucri bracteis hispidioribus, exterioribus tantum 4–9 mm. non 1–1.6 cm. longis; ligulis angustioribus; achaeniis ignotis, ovariorum aristis circ. 2.5 mm. longis.

Differs from species proper: Pedicels (up to 3 cm. long) perhaps longer; involucral bracts more hispid, outer ones only 4–9 mm. not 1–1.6 cm. long; ligules narrower; achenes unknown, ovarian aristae about 2.5 mm. long.

Specimens examined: *J. D. Snowden* 1,594, suffruticose herb in grassland and old cultivations, alt. 7,000 feet, Kigezi, Mabungo Hill, southwesternmost Uganda, Kenya Colony, October 24, 1929 (type, Kew).

Bidens Dielsii incisior var. nov.

Folia rhombo-ovata, plus minusve incise acerrimeque dentata dentibus saepius antrorsum flexis sinibus inferioribus interdum fere usque ad rhachin incisis, sub 8 cm. longa, faciebus glabra vel primum papillato-hispidula. Capitula magis congregata, pedicellis circ. 1–3 cm. longis. Achaenia matura ignota.

Leaves rhombic-ovate, more or less incisedly and very sharply dentate, under 8 cm. long, the surfaces glabrous or at first papillate-hispidulous, the teeth more often antrorsely curved, the lower sinuses at times cut almost to the rachis. Capitula grouped more closely together, pedicels about 1–3 cm. long. Mature achenes unknown.

Specimens examined: *L. C. C. Liebenberg* 367 (field no. 415), growing ±2 feet tall, near top of Mt. Moroto, Uganda, Kenya Colony, July, 1930 (type, Kew).

Bidens Grantii exaltata var. nov.

Fruticosa, ±3 m. alta, ramis tetragonis, sparsim vel sparsissime hispidis, herbaceis, internodiis superioribus quam foliis multo longioribus. Folia laxius segmentata, supra moderate infra paulo densius adpresso-hispida, ±7 cm. longa (inferiora non visa). Capitula pansa ad anthesin circ. 3 cm. lata et 7–9 mm. alta. Flores ligulati circ. 1.5 cm. longi, ligula anguste oblongo-elliptici. Achaenia corpore 3–5 mm. longa.

Fruticose, ±3 meters tall, the tetragonal and sparsely or very sparsely hispid branches herbaceous, the upper internodes much longer than the leaves; these more remotely segmented, above moderately below a little more densely appressed-hispid, ±7 cm. long (lower ones not seen). Capitula about 3 cm. wide and 7–9 mm. tall when expanded at anthesis. Ligulate florets about 1.5 cm. long, the ligule narrowly oblong-elliptic. Achenial body 3–5 mm. long.

Specimens examined: *R. W. Mettam* 255, woody shrub 10 feet tall, alt. 8,100 feet, Molo grasslands, Naivasha Province, western Kenya Colony, 1930 (type, Kew).

In the key given in my monograph on the genus *Bidens* (Field Mus. Bot. Ser. 16: 539. 1937) the present variety would run at once to *B. Grantii* proper. It differs more or less from *B. Grantii*, however, in the characters noted, chief among these being the smaller flowering-heads and, apparently, the reported shrubby habit and gigantic size. As stated in my monograph (p. 540), the type specimen of *B. Grantii* itself lacks the basal portion, but Oliver, in his original description (Trans. Linn. Soc. 29: 98, *pl. 65.* 1873), described the species as an annual. The vars. *Dawei* Sherff and *Scaettae* Sherff have definitely annual roots. Var. *Stapfii* Sherff, studied by Skan in cultivation (Curtis's Mag. *pl. 8,110.* 1906), was described as a perennial. Var. *exaltata* is seen, from the collector's data, to be a tall, woody shrub and thus clearly a perennial. The spray upon the type sheet is slightly less than 6 dm. long and might well be mistaken as representing the greater part of an annual herb.

Bidens filiformis sp. nov.

Herba annua, erecta, plus minusve glabra, supra divergenti-ramosa, ±3 dm. alta, caule sub 1.5 mm. crasso et ramis gracillimis tetragonis. Folia opposita, petiolata petiolis glabratis vel sparsim ciliatis basi connatis 0.4–1.5 cm. longis, petiolo adjecto 3–7.5 cm. longa, plerumque pinnata foliolis 3–5 filiformibus (quam rhachi ±0.3 mm. lato paulo latioribus) glabratis vel sparsim setulosis usque ad 4 cm. longis inferioribus lateralibus oppositis. Capitula solitatim ramos terminantia (pedunculis gracillimis saepius 4–9 cm. longis), radiata, pansa ad anthesin 3–3.5 cm. lata et 7–9 mm. alta. Involucri bracteae exteriores circ. 8, pallidae, angustissime oblongo-lineares et distantes, plerumque glabratae eciliataeque, apice calloso subobtusae, plerumque 4–5 mm. longae; interiores ovato-oblongae, paulo breviores, extus minutissime plus minusve setulosae, marginibus latis diaphanae et apicem versus plus minusve purpureae. Flores ligulati plerumque 8, flavi vel corollae guttur versus aurantiaci, ±1.5 cm. longi, ligula angustissime oblanceolato-lineares, apice minutissime 2-denticulati vel subintegri. Paleae lanceolatae, exteriores superne purpureae et apice puberulento acutae, interiores apice flavo elongato-tortae et demum usque ad 1.3 cm. longae. Achaenia 20–35, atra, anguste elongato-linearia, plana vel convexo-concava utraque facie circ. 8-sulculata et erecto-setulosa vel apicem basimque versus glabra, marginibus erecto-setosa, corpore 0.8–1.3 cm. longa et ±0.7 mm. lata, apice stramineo dense erecto-setosa et biaristata, aristis stramineis gracilibus subdivergentibus apice retrorsum 1- vel 2-hamosis alibi glaberrimis circ. 1 mm. longis.

Annual herb, erect, more or less glabrous, divergently branched above, ±3 dm. tall; stem 1.5 mm. or less thick, tetragonal as are the very slender branches. Leaves opposite, petiolate, 3–7.5 cm. long including petioles (these glabrate or sparsely ciliate, connate at base, 0.4–1.5 cm. long), commonly pinnate; leaflets 3–5, filiform, glabrate or sparsely setulose, up to 4 cm. long, lower lateral ones opposite, the somewhat narrower rachis under 0.3 mm. wide. Capitula singly disposed at ends of branches (these really the peduncles, very slender and more often 4–9 cm. long), radiate, 7–9 mm. tall and when expanded at anthesis 3–3.5 cm. wide. Involucre's exterior bracts about 8, pallid, very narrowly oblong-linear and mutually distant, commonly glabrate and eciliate, apically calloused and subobtuse, commonly 4–5 mm. long; interior bracts ovate-oblong, slightly shorter, on outer surface very minutely more or less setulose, diaphanous along the broad margins and more or less purple toward the apex. Ligulate florets commonly 8, yellow or toward throat of corolla orange, ±1.5 cm. long, the ligule very narrowly oblanceolate-linear and at apex very minutely 2-denticulate or subentire. Paleae lanceolate, outer ones supernally purple and at puberulent apex acute, inner ones elongate-twisted at yellow apex and finally up to 1.3 cm. long. Achenes 20–35, dull-black, narrowly elongate-linear, flat or convexo-concave, on each face about 8-sulculate and erectly setulose

or toward both ends glabrous, marginally erect-setose, body 0.8–1.3 cm. long and ±0.7 mm. wide, the straw-colored apex densely erect-setose and biaristate; aristae straw-colored, delicate, subdivergent, at apex retrorsely 1- or 2-barbed, elsewhere very glabrous, about 1 mm. long.

Specimens examined: *B. D. Burtt* 6,269, alt. 4,500–5,000 feet, Lake Chila, Northern Rhodesia, April, 1936 (type, Field).

In the key presented in my monograph on *Bidens* (Field Mus. Bot. Ser. 16: 62. 1937) *B. filiformis* would stand under the first letter *f* at the top of the page, with *B. Schimperi.* From that species it differs: ±3 dm. not 5–15 dm. tall, glabrous or nearly so; leaves normally 1- not 2–3-pinnate, at most 7.5 not up to 15 cm. long, their divisions filiform, not linear-lanceolate or broader; exterior involucral bracts not dilated above; achenes ±0.7 not 2–2.6 mm. wide, their aristae about 1 not 2.5–4 mm. long, etc.

From the northeastern Belgian Congo *B. Onisciformis,* which was included parenthetically and somewhat interrogatively under the same letter *f* in the key cited, *B. filiformis* differs in its more branched and obviously annual habit, its elongate and not onisciform achenes, etc. Unfortunately, the conspicuously radiate *B. diversa* var. *megaglossa* was misplaced with the shortly radiate *B. diversa* proper under the second letter *e* on the page cited, though belonging in reality under the first *e.* Under the first *e,* this var. *megaglossa* would likewise go to the first *f.* *B. filiformis,* though habitally somewhat similar to *B. diversa* var. *megaglossa,* differs at once in its proportionately narrower, more elongate outer involucral bracts, these commonly eciliate and 4–5 mm. not ciliate and only 1–2 mm. long, in having a purplish tinge near the tops of the inner involucral bracts and of the outer paleae, etc.

Bidens modesta sp. nov.

Herba perennis, infra subfruticosa, erecta, ±5 dm. alta; caule simplici subsimplicive, gracili (1.5–3 mm. crasso), subtetragono, sulculato, glabro. Folia opposita, subpauca vel subnumerosa, principalia tenuiter petiolata petiolis glabris vel infra sparsissime ciliatis plerumque 2–3.5 cm. longis angustissime marginatis basi connatis, petiolo adjecto 6–11 cm. longa et 1.5–3 cm. lata; lamina subanguste ovato-rhomboidea vel sublate lanceolato-rhomboidea, membranacea, glabra (etiam eciliata) vel infra interdum perpaucis setis vestita, infra medium plerumque cuneata integraque, supra medium minute grosseve dentata 2–4 dentibus pro utroque latere, apice acuta vel

subacuminata, venis principalibus paucis et perspicue antrorsis. Capitula perpauca (±2), graciliter pedunculata pedunculo glabro usque ad 1.6 dm. longo, radiata, pansa ad anthesin circ. 4 cm. lata et ±1.3 cm. alta. Involucri basaliter sparsissime vel moderate hispiduli bracteae exteriores circ. 8, adpressae, oblongae, apice calloso obtusae vel rotundatae, circ. 5–6 mm. longae, tergo glabrae vel porriginosae; interiores ovatae vel ovato-oblongae, tergo glabratae vel minutissime puberulentae, apice pubescentes, 8–10 mm. longae. Flores ligulati circ. 8, flavi, ±2 cm. longi, ligula lineari-oblongi, apice subintegri, extus glabrati, intus velutino-puberulenti. Paleae lineari-oblongi quam involucrum breviores. Flores tubulosi corolla extus glaberrimi et 5.5–6 mm. longi. Achaenia matura non visa. Ovaria plana, lineari-oblonga, atro-brunnea, faciebus glabrata, marginibus erecto-setulosa setulis e tuberculo saepius ortis, corpore ±4 mm. longa et sub 1 mm. lata, apice erecte setosa et biaristata; aristis gracilibus, divergentibus, flavo-brunneis, circ. 2.5 mm. longis, intus continenter extus sparsim vel interrupte retrorso-hamosis.

Perennial herb, suffruticose below, erect, ±5 dm. tall; stem simple or subsimple, slender (1.5–3 mm. thick), subquadrangular, sulculate, glabrous. Leaves opposite, somewhat few or somewhat numerous, principal ones slenderly petiolate, 1.5–3 cm. wide and 6–11 cm. long including petioles; these glabrous or toward base very sparsely ciliate, commonly 2–3.5 cm. long, very narrowly marginate, connate at base; blades subnarrowly ovate-rhomboid or subwidely lanceolate-rhomboid, membranaceous, glabrous (even eciliate) or sometimes clothed below with a very few setae, commonly cuneate and entire below middle, minutely or coarsely dentate above middle with 2–4 teeth to each side, at apex acute or subacuminate, principal veins few and conspicuously antrorse. Capitula very few (±2), slenderly pedunculate, radiate, expanded at anthesis about 4 cm. wide and ±1.8 cm. tall; peduncle glabrous, up to 1.6 dm. long. Involucre at base very sparsely or moderately hispidulous; exterior bracts about 8, appressed, oblong, calloused and obtuse or rounded at apex, about 5–6 mm. long, dorsally glabrous or scurfy; interior bracts ovate or ovate-oblong, dorsally glabrate or very minutely puberulent, apically pubescent, 8–10 mm. long. Ligulate florets about 8, yellow, ±2 cm. long; ligule linear-oblong, at apex subentire, externally glabrate, internally velvety-puberulent. Paleae linear-oblong, shorter than the involucre. Mature achenes not seen. Ovaries flat, linear-oblong, blackish-brown, on faces glabrate, on margins erect-setulose with setulae more often arising from a tubercle, as to body ±4 mm. long

and under 1 mm. wide, at apex erectly setose and biaristate; aristae slender, divergent, yellowish-brown, about 2.5 mm. long, on inner edge continuously on outer sparsely or interruptedly retrorse-barbed.

Specimens examined: *John Gossweiler* 11,899, a perennial much dispersed in *hiemifruticeta,* alt. 1,700 meters, Huambo, New Lisbon, Angola, 1937 (type, Kew: cotype, Field).

In the key presented in my monograph on *Bidens* (Field Mus. Bot. Ser. 16: 63. 1937) *B. modesta* would stand with *B. Moorei* and its var. *verrucosa,* under the second letter *i* at the bottom of the page. From these it differs in its longer leaves, these petiolate not sessile; its smaller capitula, hence smaller floral and fruiting parts, doubtless shorter achenial aristae and more glabrous achenial faces, etc.

Bidens Gossweileri sp. nov.

Herba perennis, subfruticosa, erecta, omnino glaberrima, ±5 dm. alta, supra ramosa ramis suberectis plus minusve tetragonis, caule inferne nudo sed mediane confertissime folioso. Folia plerumque opposita, petiolata petiolis angustis planis saepius 1–2 cm. longis et 0.7–1.4 mm. latis, petiolo adjecto 5–12 cm. longis; lamina pinnata vel vix subbipinnata; foliolis saepius 3–5, quam rhachi simili paulo latioribus (angustissime linearibus et tantum 1–2.2 mm. latis), 1–6 cm. longis, eciliatis, apice acutis subacutisve, plerumque simplicibus, lateralibus saepius oppositis, nervo mediano pro una facie obscuro pro altera plano perspicuoque. Capitula pauca (±6 pro unica planta), subgraciliter pedunculata pedunculo usque ad 1.6 dm. longo, radiata, pansa ad anthesin ±2.5 cm. lata et ±1.1 cm. alta. Involucri bracteae exteriores 7–12, lanceolatae vel lineari-oblongae, 1–3-seriales, adpressae, apice induratae et obtusae rotundaeve, 4–7 mm. longae; interiores lanceolato-oblongae, apice minutissime pubescentes aliter glabrae, usque ad 9 mm. longae. Flores ligulati circ. 8, flavi, ±1.2 cm. longi, ligula lineari-oblongi, apice subintegro subacuti, facie superiore (interiore) densissime velutino-puberulenti, alibi glabrati. Paleae oblongo-lineares, apice acutae, sub apice saepe 1-denticulatae, 7–9 mm. longae. Achaenia submatura linearia vel lineari-oblonga, brunneo-grisea vel atro-brunnea, plana, utraque facie circ. 8-sulculata, faciebus marginibusque dense erecto-setosa (vel imis faciebus glabratis), corpore 5–9.5 mm. longa et 0.5–1 mm. lata, apice erecto-setosa et biaristata; aristis subrectis, moderate divergentibus, de apice usque ad basim retrorsum hamosis, plerumque 2–2.5 mm. longis.

Perennial herb, suffruticose, erect, very glabrous throughout, ±5 dm. tall, branched above with suberect and more or less tetragonal branches; stem nude toward base but very densely foliose at middle. Leaves commonly opposite, petiolate, 5–12 cm. long including petioles; these narrow, flat, more often 1–2 cm. long and 0.7–1.4 mm. wide; blades pinnate or scarcely subbipinnate; leaflets more often 3–5, very narrowly linear and only 1–2.2 mm. wide, a little wider than the similar rachis, 1–6 cm. long, eciliate, at apex acute or subacute, commonly simple, lateral ones more often opposite, the median nerve obscure for one surface but flat and conspicuous for the other. Capitula few (±6 to a single plant), somewhat delicately pedunculate with a peduncle up to 1.6 dm. long, radiate, expanded at anthesis ±2.5 cm. wide and ±1.1 cm. tall. Involucre's exterior bracts 7–12, lanceolate or linear-oblong, 1–3-seriate, appressed, apically indurated and obtuse or rounded, 4–7 mm. long; interior bracts lanceolate-oblong, at apex very minutely pubescent, otherwise glabrous, up to 9 mm. long. Ligulate florets about 8, yellow, ±1.2 cm. long; ligule linear-oblong, at apex subentire and subacute, on upper or inner face very densely velvety-puberulent, elsewhere glabrate. Paleae oblong-linear, at apex acute, below apex often 1-denticulate, 7–9 mm. long. Achenes when submature linear-oblong, brownish-gray or blackish-brown, flat, on each face about 8-sulculate, on faces and margins densely erect-setose (or at bottom of faces glabrate), as to body 5–9.5 mm. long and 0.5–1 mm. wide, at apex erect-setose and biaristate; aristae nearly straight, moderately divergent, from the apex almost to the base retrorsely barbed, commonly 2–2.5 mm. long.

Specimens examined: *John Gossweiler* 11,845, dispersed in *hiemi-fruticeta*, alt. 1,000 meters, Xassengue-Caiango, near Cuango River, Lunda region, Angola, April, 1937 (type, Kew).

In the key presented in my monograph on *Bidens* (Field Mus. Bot. Ser. 16: 65. 1937), *B. Gossweileri* would go to the first letter *o*, p. 65, and thus to *B. Hoffmannii*. From that species it differs in having leaves 5–12 not 2–5 cm. long, eciliate and longer leaf-petioles, proportionately narrower and longer leaf-divisions, 7–12 apically obtuse or rounded rather than mostly 6 apically acute exterior involucral bracts, doubtless narrower achenial bodies, aristae at least 2–2.5 not 1.5–1.75 mm. long, etc.

Bidens Bruceae Sherff, Bot. Gaz. 97: 606. 1936.

This species was named after Miss E. M. Bruce, but the trivial name was unfortunately misspelled *Brucei* at the time of its original publication.

Bidens coronata (L.) Britt. Bull. Torr. Bot. Club 20: 281. 1893; cf. Sherff, Bot. Gaz. 56: 495. 1913; *B. coronata* vars. *typica* Fern., *brachyodonta* Fern., and *trichosperma* (Michx.) Fern. Rhodora 40: 349, 350. 1938.

Fernald (op. cit. 348), relying upon an all too scanty assortment of specimens, divides *B. coronata* into four varieties. His analytical key to these varieties proves unusable when applied to much of the material found in various herbaria. During my own monographic work over a period of a quarter of a century upon *Bidens*, I myself tried several times to arrange the specimens of *B. coronata* under several varieties, but finally concluded that only the variety *tenuiloba*, as apart from the species proper (var. *typica* Fern.) was worthy. Even the var. *tenuiloba* appears to intergrade with *B. coronata* proper. In general, however, the leaf-divisions of var. *tenuiloba* are narrower and its achenes shorter.

Fernald's key to the varieties of *B. coronata* is based largely on achenial characters. How he knows what these are for his var. *typica* I cannot say. It is true that in 1915 I sent him a print from my large photograph of the Linnean type. It likewise is true that, under date of January 21, 1915, he wrote me: "There is no doubt I think, that your photograph of *B. coronata* represents *B. trichosperma* or something like it. Furthermore I find that Dr. Gray had a fragment from the Linnean herbarium (you will note in your photograph that some heads are gone) and that shows perfectly characteristic fruit of *B. trichosperma*, not of '*B. coronata*' of recent authors." However, in April of the same year, I publicly quoted from Fernald's letter (Bot. Gaz. 59: 314). Whereupon, I received from Dr. B. Daydon Jackson, General Secretary of the Linnean Society, a letter under date of May 10, 1915, expressing surprise regarding the reputed Gray fragment. To quote from his letter: "A few days ago I wrote to Dr. Fernald, asking for the history of the Gray fragment mentioned.... as I cannot understand how a fragment, even if loose, was removed from the Linnean herbarium, a process which would be regarded by our Council as sacrilegious, and will horrify them when announced. I will wait however for Dr. Fernald's reply." Under date of May 21, 1915, Professor Fernald sent this awaited reply, a copy of which, in Miss Mary A. Day's well known handwriting and sent me at that time by Professor Fernald himself, lies before me. To quote from it regarding the "fragment": "I find that, far from being 'certain heads' as implied in Mr. Sherff's note, it consists of three florets in a packet labelled by Dr. Gray 'Ex Hb. Linn.' " And in a letter by Professor Fernald directly to me under date of June 2, 1915, he referred to what he had originally called a "fragment" as mere "bits (three florets, not heads) of *Coreopsis coronata.*"[1] Granting that the three florets whose presence at Gray Herbarium was acknowledged by Fernald were indeed all of Gray's fragment, it seems safe to presume that Gray obtained them, not as part of a mature head which at the time was removed from the type, but from one of the five or six flowering heads still possessed by it. These were comparatively young, only one being at full anthesis. To designate mere ovaries of florets thus derived as "perfectly characteristic fruit of *B. trichosperma*" as Fernald did in his letter of January 21, would seem indeed gratuitous, if not entirely misleading. In any case, it is difficult to understand how they could afford a satisfactory basis on which to delimit, in terms primarily of achenial (instead of foliar) characters, a var. *typica.*

Bidens heterodoxa var. **atheistica** Fern. Rhodora 34: 116. 1932; *B. infirma* Fern. op. cit. 40: 351, *pl. 507, figs. 1–3.* 1938.

Fernald, writing originally of this variety, stated: "Var. *atheistica,* essentially without awns, has the foliage, involucres, and other characters quite as in typical *B. heterodoxa.*" He later elevated it to specific rank, renaming it *Bidens infirma* in allusion doubtless to its habit of growth. His type and other cited material, now before me, seem nothing more than a variety of *B. heterodoxa.* They have a sprawling or diffuse growth-habit and thus are related to *B. heterodoxa* somewhat as *B. hyperborea* var. *gaspensis* Fern. is to *B. hyperborea* Greene, or as *B. cernua* var. *oligodonta* Fern. & St. J. is to *B. cernua* L. They have simple leaves and thus are related to *B. heterodoxa* somewhat as *B. connata* var. *petiolata* (Nutt.) Farw. is to *B. connata.* They have awnless or short-awned achenes and thus are related to *B. heterodoxa* somewhat as *B. aristosa* var. *mutica* A. Gr. *ex* Gatting. is to *B. aristosa* (Michx.) Britt. They have fewer florets in a capitulum than has *B. heterodoxa,* but, from a study of numerous species of *Bidens* in which forms or varieties are found with more diffuse habit and more numerous capitula, this may well be construed as being merely an expression or result of the growth-form. Fernald makes much of the more or less convex or subconic achenial apex, but this character is highly inconstant in various species of *Bidens,* especially those of the Polynesian section *Campylotheca* (Cass.) Nutt. (e.g., *B. macrocarpa* [Gray] Sherff; cf. Field Mus. Bot. Ser. 16: *pl. 17,*

---

[1] Clearly, if there was any error regarding the existence at Gray Herbarium of "'certain heads' as implied in Mr. Sherff's note," I must regretfully attribute the blame to Fernald's own letter of January 21.

figs. h and *l*), and seems all too weak a character on which to attempt here a specific segregation.[1]

Coreopsis ochracea Lugardii var. nov.

Caules gracillimi, ±1 mm. crassi. Folia petiolo usque ad 1.5 cm. longo adjecto sub 5 cm. longa; segmentis saepius 3, sub 2.5 mm. latis. Capitula pansa ad anthesin sub 3.5 cm. lata. Involucri bracteae exteriores lineari-oblongae, ±6 mm. longae. Achaenia ignota. Ovaria exaristata sed apice marginibusque dense erecto-setosa.

Stems very slender, ±1 mm. thick. Leaves under 5 cm. long, including the petiole (this up to 1.5 cm. long); segments more often 3, under 2.5 mm. wide. Capitula less than 3.5 cm. wide when expanded at anthesis. Outer involucral bracts linear-oblong, ±6 mm. long. Achenes unknown. Ovaries exaristate but at apex and margins densely erect-setose.

Specimens examined: *Major E. J. Lugard K*4, growing erect and up to 2 feet tall, alt. 6,400 feet, Kapenguria, Kenya Colony, January 11, 1931 (type, Kew).

Coreopsis grandiflora Hogg *ex* Sweet, Brit. Fl. Gard. 2: *pl. 175.* 1826.

Fernald (Rhodora 40: 475. 1938) writes: "Although Sherff, l.c. 353, gives the mystifying range Missouri and Kansas southward to Florida, etc., he cites material from Georgia."

For those who quite naturally might be *mystified* by Fernald's incomplete and hence misleading quotation from what really was given in my original text, recourse should be had to the text itself (Field Mus. Bot. Ser. 16: 353. 1936): "Distribution: Missouri and Kansas southward to Florida, Louisiana, and New Mexico." This statement of geographic range would seem to lack those elements which ordinarily conduce to sincere mystification. I am in turn, however, much mystified (1) by Fernald's omission of the words "Louisiana, and New Mexico" given in my original text and (2) by his surprise that Georgia material should be cited from the range as it was actually described.

---

[1] It is indeed unfortunate that the species *B. heterodoxa* was ever based upon the enigmatic material which was taken for its type. One cannot help feeling that the specimens later discovered and used to typify, for example, *B. heterodoxa* var. *Monardaefolia* Fern. would have given a more definite and understandable basis if they could have been used for the type basis of the species proper (leaving the form actually named *B. heterodoxa* to be given a varietal rank instead). However, *B. heterodoxa* and its varieties are found mostly in brackish situations of northeastern North America, and so also are the closely allied *B. hyperborea* Greene and its varieties. It is entirely logical, therefore, to interpret the intra-relationships of *B. heterodoxa* in the light of those found in *B. hyperborea.* This is undoubtedly what Fernald did when he originally construed his *B. infirma* as *B. heterodoxa* var. *atheistica,* since he possessed some years ago, either singly or in conjunction with his students Harold St. John, N. C. Fassett, and H. K. Svenson, an unrivaled field-knowledge of *B. hyperborea.* His earlier judgment, reached at more nearly the zenith of his field activity in the study of *B. heterodoxa* and *B. hyperborea* (inclusive of their varieties), is the judgment that seems to me the safer one to accept.

Coreopsis Linifolia Nutt. Journ. Acad. Phila. 7: 75. 1834; *C. Oniscicarpa* Fern. Rhodora 40: 472, *pl. 533*. 1938.

In preparing the treatment of *Coreopsis Linifolia* Nutt. for my monograph on *Coreopsis* (Field Mus. Bot. Ser. 11: 435. 1936) it was found that I had previously included several specimens of *C. longifolia* Small, because of improperly interpreting the two species. I therefore retained, for "specimens examined" of *C. Linifolia,* only a few that could be re-examined before going to press (and so stated on p. 436). Thus it happened that my carefully drawn description of geographic range of *C. Linifolia,* as starting in the north with North Carolina (the farthest north then known to me), was not supported by citation of any eastern-coastal specimens from farther north than Florida. Fernald (loc. cit.) seems to have been moved all too much by this fact in segregating as a new species, *C. Oniscicarpa,* some specimens recently collected in Virginia. Since the publication of his *C. Oniscicarpa,* I have been permitted through the kindness of various botanists to examine much additional material. Some of the specimens lent me by Mr. Charles A. Weatherby, Senior Curator of Gray Herbarium, and by Mr. Robert K. Godfrey, a graduate student at Harvard University, had come from Virginia and were the ones cited by Fernald for his *C. Oniscicarpa,* one of them being the type of that species. A careful comparison of each specimen with Floridan and other southern specimens of *C. Linifolia* Nutt. showed no constant differences in foliar or capitular characters to warrant separating *C. Oniscicarpa* even varietally from *C. Linifolia.*

Coreopsis lanceolata L. Sp. Pl. 908. 1753; *Coreopsis heterogyna* Fern. Rhodora 40: 475, *pl. 535, figs. 1–9.* 1938.

Coreopsis lanceolata L. offends notoriously the lover of constancy in growth form. Here and there throughout its geographic range it frequently produces variants that strongly suggest allied species or reciprocal variants of allied species (such as *C. grandiflora* Hogg, *C. pubescens* Ell., *C. auriculata* L., and *C. intermedia* Sherff). One such variant is the form recently described by Fernald as *C. heterogyna.* In proposing this form as a new species, Fernald appears to have been misled by placing too much stress upon a necessarily arbitrary and narrow description (in this case, of *C. lanceolata,* from which he sought to differentiate it) found in literature, rather than upon a study of sufficiently numerous and thus sufficiently representative *exsiccatae*. In my monograph on *Coreopsis* (Field Mus. Bot. Ser. 11: 341. 1936), a work much cited by Fernald, I included numerous forms of wide geographic distribution and more or less matching *C. heterogyna* in foliage, among them: *Lansing* 935, Clarke, Indiana; *Lighthipe*, Monticello, Florida; *Rolfs* 309, Florida; *Schuette*, Door, Wisconsin; *Whitford* 203, Cold Spring Harbor, New York (all in Herb. Field Mus.). Fernald emphasizes the large central achenes of *C. heterogyna*, these having bodies 3.5–4 mm. long and 2–2.5 mm. wide and brown wings 1–1.5 mm. wide. The Lansing specimen has many central achenes with a body about 3 mm. long and 1.4–2 mm. wide and brown wings 0.7–1 mm. wide. The Rolfs specimen has several central achenes with a body 3.1 mm. long and 2–2.2 mm. wide and brown wings about 0.3–0.4 mm. wide (in measuring body length I have uniformly measured merely the distance in a straight line from one end of the curved body to the other; if the curved body were softened and flattened out it would of course measure more). I have before me other specimens with central achenial measurements slightly half as great. With such a range of achenial variation as *C. lanceolata* thus displays, it appears futile to attempt the maintenance of Fernald's *C. heterogyna* even as a variety or forma (i.e., of *C. lanceolata*).[1]

Coreopsis grandiflora var. **Harveyana** (A. Gray) Sherff, Bot. Gaz. 94: 593. 1933; Field Mus. Bot. Ser. 11: 355. 1936.

Heretofore I have seen no specimens of this variety from east of Missouri and Arkansas. Among some Alabama plants recently sent me by Dr. H. K. Svenson of the Brooklyn Botanical Garden, was one that very definitely belongs here, although it is seen, on comparison with numerous Missouri and Arkansas specimens, to be slightly atypic. It was collected by R. N. Harper and H. K. Svenson, on exposed granite, Flat Rock (north of Ashland), August 3, 1938. A specimen is in Field Museum.

---

[1] Fernald's other distinctions drawn for *C. heterogyna* likewise disappear upon examination of abundant material. Thus, for example, he illustrates (*fig. 2*, loc. cit.) the involucre of *C. heterogyna* with its reflexed outer bracts. He contrasts *C. lanceolata* as having the outer bracts (*fig. 12*, loc. cit.) "remaining appressed-ascending." It is difficult to understand how he would advance a "distinction" so utterly untenable. Much (though by no means all or even one-half) of the *C. lanceolata* fruiting material found in herbaria has all or most of the outer bracts *definitely spreading or reflexed* and *involucres large*, as in Fernald's illustration (*fig. 2*) of that for *C. heterogyna*. I have before me the following such specimens belonging to the Field Museum of Natural History: *J. J. Davis*, Sheboygan, Wisconsin, July 16, 1929; *F. C. Gates* 13,128, Emmet County, Michigan, July 29, 1921; *R. K. Godfrey*, near Raleigh, North Carolina, May 22, 1937; *J. H. Schuette*, north of Sturgeon Bay Canal, Wisconsin, July 14, 1890; *H. N. Whitford* 64, Cold Spring Harbor, New York, August, 1903. In addition to these specimens may be cited two additional ones possessing such characters but belonging rather with *C. lanceolata* var. *villosa* Michx.: *Dr. Josiah Hale*, Louisiana; *Earl E. Sherff* 5,018, cult., Cambridge,

Coreopsis pubescens var. **robusta** A. Gray *ex* Eames, Rhodora 18: 239. 1916; Sherff, Field Mus. Bot. Ser. 11: 351. 1936.

Previously examined specimens showed for this variety a range of Virginia and North Carolina. This range is now extended to include Alabama, where it has been collected by R. N. Harper and H. K. Svenson, on dry ravine slopes, Brush Creek, east of Tuscaloosa, August 2, 1938. A specimen (now in Field Museum) was among those very kindly sent me by Dr. Svenson.

Dubautia laxa Skottsbergii var. nov.

Folia tenuiora, anguste ovata vel saepius late oblanceolata, utrinque adpresso-hispida, 4–7 cm. longa et 1–1.8 cm. lata. Inflorescentia ignota.

Leaves thinner, narrowly ovate or more often widely oblanceolate, on both surfaces appressed-hispid, 4–7 cm. long and 1–1.8 cm. wide. Inflorescence unknown.

Specimens examined: *Lucy M. Cranwell, Olof H. Selling, & Carl Skottsberg* 2976, between Lehuamakanoi and the main bog, Alakai, northwestern Kauai, August 16, 1938 (type, Goth.).

Dubautia laxa Hook. & Arn. is represented in the northwestern part of the Island of Kauai only by its variety *pedicellata* Rock. From this variety, as indeed from all other known varieties of *D. laxa*, the material here described differs at once in its much smaller or proportionately narrower and its somewhat thinner leaves. The two specimens constituting the type both lack flowers and fruits, which are much to be desired.

Massachusetts, August 12, 1929. It thus becomes evident that, even if Fernald were to attempt maintenance of his *heterogyna* form as a variety of *C. lanceolata*, he would at once be under compulsion to disentangle his reported involucral characters for *heterogyna* from the pubescence character commonly associated with var. *villosa*, failing which, he might conceivably have to accept the earlier varietal name *villosa* Michx. (my own notes taken in Paris are silent as to the exact characters of the type of var. *villosa* Michx.).

At all events, it seems regrettable that in proposing *Coreopsis heterogyna* and numerous other so-called "species" and "varieties" as new, Fernald has proceeded all too often from the standpoint of local floristics, ignoring the fruits of extended monographic research. As every competent monographer can testify, one of the chief causes contributing in the past to the cluttering of our nomenclature with synonyms has been the provincialized and untenable concepts proposed either by students of local floristics or by students who, while emphasizing the importance of monographic research in their own favorite groups, chose to minimize it elsewhere.

The variety is named for Dr. Skottsberg, one of its collectors, in grateful appreciation of his invaluable assistance, over a period of years, upon *Dubautia* and various other Polynesian genera.

INDEX

Synonyms in *italics*

Acacia, 365
  Farnesiana, 365
  Milleriana, 365
  salvadorensis, 365
Acalypha, 373
  alopecuroides, 373
  leptopoda, 373
  macrostachya, 373
  porphyrantha, 373
Acanthaceae, 394
Acetosa, 6
Acetosella, 6
Achimenes, 393
  grandiflora, 393
  longiflora, 393
Achyrocline, 399
  deflexa, 400
  Yunckeri, 399
Acrostichum, 301
  daneaefolium, 301
Actinidiaceae, 376
Adiantopsis, 301
  radiata, 301
Adiantum, 301
  concinnum, 301
  tenerum, 301
  trapezoides, 301
Agastache ionocalyx, 272
  Palmeri, 272
Ageratum, 400
  conyzoides, 400
Aleurites moluccana, 559
  Remyi, 558
Alismaceae, 311
Alsophila, 300
  mexicana, 300
  Schiedeana, 300
Amaioua contracta, 211
Amaranthaceae, 240
Amaranthus Parodii, 240
Amaryllidaceae, 229, 323
Ampelocera Hottlei, 234
Amphilophium, 392
  pilosum, 392
Amyris Marshii, 195
  monophylla, 197
Anacardiaceae, 374
Anaptychia, 295
  leucomelaena, 295
  leucomelaena var. albociliata, 295
  podocarpa var. conferta, 295
Andropogon, 312
  bicornis, 312
  furcatus, 312
  leucostachyus, 312
Anemia, 299
  adiantifolia, 299
  humilis, 299
  pastinacaria, 299
  Phyllitidis, 299
Añilillo, 266
Aniseia martinicensis, 206
Anisomeris, 394
  protracta, 394, 395
  rudis, 394
Anneslia centralis, 366
  pueblana, 367
Annonaceae, 363
Anthericum crinitum, 228
Anthurium, 316
  basiattenuatum, 316
  concinnatum, 317
  lucens, 317
  pallens, 317
  parvispathum, 317
  scandens, 317
  Yunckeri, 317
Antidesma platyphyllum, 561, 568
  platyphyllum var. genuinum f. rubrum, 571
  platyphyllum var. hamakuaense, 572
  platyphyllum var. Hillebrandii, 572
  platyphyllum var. subamplexicaule, 573
  pulvinatum, 574
  pulvinatum var. leiogonum, 576
Apiu, 161
Apocynaceae, 387
Apui, 159
Aquatici, 7
Aquifoliaceae, 198, 374
Araceae, 316
Aralia, 383
  humilis, 383
Araliaceae, 205, 267, 383
Arbutus, 385
  xalapensis, 385
Ardisia, 385
  compressa, 385
Arenaria, 362
  lanuginosa, 362
Aristolochia brevipes, 238
  Cardenasii, 237
  Marshii, 238
  martiniana, 238
  quercetorum, 239
Aristolochiaceae, 237
Artanthe Galeottii, 347
Arthrostemma, 381
  fragile, 381
Arundinaria, 312
Asclepiadaceae, 267, 387

Asclepias, 387
  curassavica, 387
  guatemalensis, 387
Asplenium, 301
  auritum, 301
  cristatum, 301
  formosum, 301
  miradorense, 301
  praemorsum, 301
  radicans var. partitum, 301
  serra, 301
  serratum, 301
Asta, 236
Aster, 400
  bullatus, 400
  lateriflorus, 435
  paniculatus, 435
Ataco, 241
Atrichum, 298
  angustatum var. Mulleri, 298
Axillares, 6, 8
Axonopus, 312
  rhizomatosus, 312

Baccharis, 400
  glutinosa, 400
  trinervis, 400
Bacopa, 392
  rotundifolia, 392
Bambusa, 312
Bartramiaceae, 296
Bassia hyssopifolia, 240
Befaria, 385
  mexicana, 385
Begonia, 378
  MacDanielsii, 266
  tovarensis, 378
  Yunckeri, 378
Begoniaceae, 266, 378
Bertiera guianensis, 274
Besleria, 393
  laxiflora, 393
Betulaceae, 356
Bidens, 400
  aristosa, 607
  aristosa var. mutica, 607
  Bequaertii var. amplior, 595
  Bruceae, 605
  cernua, 607
  cernua var. oligodonta, 607
  Chandleri, 597
  connata, 607
  connata var. petiolata, 607
  coronata, 606
  coronata var. *brachyodonta*, 606
  coronata var. tenuiloba, 606
  coronata var. *trichosperma*, 606
  coronata var. *typica*, 606
  Dielsii var. incisior, 599
  diversa var. megaglossa, 602
  dolosa, 596
  Elliotii, 594
  filiformis, 600
  Gossweileri, 604
  Grantii, 600
  Grantii var. Dawei, 600
  Grantii var. exaltata, 600
  Grantii var. Scaettae, 600
  Grantii var. Stapfii, 600
  heterodoxa var. atheistica, 607
  Hoffmannii, 605
  Hoffmannii var. angustata, 595
  hyperborea, 607
  hyperborea var. gaspensis, 607
  imatongensis, 588
  infirma, 607
  insignis, 591
  Lynesii, 590
  magnifolia, 597
  modesta, 602
  Moorei, 604
  Moorei var. verrucosa, 604
  nobilis, 593
  Onisciformis, 602
  pilosa var. radiata, 400
  rubifolia, 597
  Schimperi, 602
  Schimperi var. brachycera, 585
  Schimperi var. leiocera, 586
  Schlechteri, 594
  Schweinfurthii, 599
  Snowdenii, 586
  somaliensis, 584
  somaliensis var. bukobensis, 584
  Steppia var. Elskensii, 584
  superba var. brachycarpa, 599
  taitensis, 595
  Taylorae, 594
Bignoniaceae, 392
Bird fig, 171
Blakea, 381
  aeruginosa, 381
Blechnum, 301
  occidentale, 301
  unilaterale, 301
Boehmeria, 360
  caudata, 360
Boerhaavia, 361
  erecta, 361
Bomarea, 323
  ovata, 323
Bombacaceae, 199, 266
Boraginaceae, 389
Borreria, 395
  fruticosa, 395
Brassavola, 324
  cucullata, 324
Brittonastrum ionocalyx, 272
  Palmeri, 272
Bromeliaceae, 318
Brosimopsis, 156
Brosimum acutifolium, 156
  caniceps, 156
  Krukovii, 157
  myristicoides, 157
  palmarum, 158

Brosimum paraense, 157
  potabile, 158
  terrabanum, 235
Bryaceae, 296
Bryophyllum, 363
  pinnatum, 363
Bryum, 296
  andicola, 296
  argenteum var. lanatum, 296
Buchnera, 392
  pusilla, 392
Bunchosia, 372
  pilosa, 372
Byrsonima, 373
  crassifolia, 373

Cactaceae, 379
Cafecillo, 274
Calathea, 324
  verapax, 324
Calliandra, 365
  arborea, 365
  centralis, 366
  Gentryi, 261
  leucothrix, 366
  Yunckeri, 367
Callicarpa, 389
  acuminata, 389
Callirrhoe sidalceoides, 198
Calocarpum, 385
  mammosum, 385
Calopogonium, 367
  coeruleum, 367
Calpidea Brunoniana, 542
Calyptranthes, 379
  hondurensis, 379
Campelia, 322
  Zanonia, 322
Canavalia, 367
  villosa, 367
Cápida, 202
Capparidaceae, 191
Capparis Millei, 191
Caprifoliaceae, 398
Capsicum, 390
  macrophyllum, 390
Caraco, 163, 164
Cardiospermum, 375
  microcarpum, 375
Carex, 314, 442
  Humboldtiana, 314
  polystachya, 314
Caricaceae, 200
Caryophyllaceae, 190, 244, 362
Cassia, 367
  laevigata, 367
  serpens, 368
  spectabilis, 368
Castanha, 257
Catasetum, 324
  maculatum, 324
Catopsis, 318
  brevifolia, 318
  nitida, 318
  nutans, 318
  Oerstediana, 318
  subulata, 318
Cautivo, 234
Cecropia, 359
  mexicana, 359
Celastraceae, 375
Celtis Hottlei, 234
Centradenia, 382
  Bernoullii, 382
Cephaelis, 395
  axillaris, 395
  elata, 395
  madeirana, 212
Cerastium guatemalense, 244
Cereus, 379
  hondurensis, 379
Cestrum, 390
  nocturnum var. mexicanum, 390
Chaetoptelea, 359
  mexicana, 359
Chamaedorea, 316
  geonomaeformis, 316
  graminifolia, 316
  Lindeniana, 316
Chancarro blanco, 267
Chaptalia, 400
  nutans, 400
Cheilanthes, 301
  angustifolia, 301
Chenopodiaceae, 240
Chimaphila, 384
  dasystemma, 384
Chiococca, 395
  alba, 395
  phaenostemon, 395
Chiodecton, 294
  sanguineum, 294
Chiodectonaceae, 294
Chirigua, 200
Chloranthaceae, 356
Chócola, 201, 202
Chrysophyllum, 385
  oliviforme, 385
Chrysopsis, 423
Chthamalia nummularia, 270
Cibotium, 300
  regale, 300
Cissampelos, 362
  Pareira, 362
  tropaeolifolia, 362
Cissus, 375
  cacuminis, 375
  Martiniana, 376
  rhombifolia, 376
  salutaris, 376
  sicyoides, 376
Citharexylum, 389
  Mocinni, 389
Cladonia, 294
  chlorophaea, 294

Cladonia corymbulosa, 294
  cristatella, 294
  didyma, 295
  fimbriata, 295
  fimbriata var. Balfourii, 295
  fimbriata var. chondroidea, 295
  Floerkeana, 295
  furcata var. pinnata, 295
  pityrea, 295
  subcariosa, 295
Cladoniaceae, 294
Claoxylon, 548
  Helleri, 549
  insigne, 557
  Remyi, 557
  sandwicense, 550
  sandwicense var. ζ Degeneri, 556
  sandwicense var. ε glabrescens, 555
  sandwicense var. γ Hillebrandii, 554
  sandwicense var. β magnifolium, 551
  sandwicense var. magnifolium f. glabrescens, 555
  sandwicense var. δ tomentosum, 554
  tomentosum, 549
Clavellino, 262
Clerodendron ligustrinum, 207
  Matudae, 206
Clethra, 384
  hondurensis, 384
Clethraceae, 384
Clidemia, 382
  dentata, 382
  hirta, 382
  rubra, 382
Clusia, 377
  Salvinii, 377
Coccocarpia, 294
  cronia var. isidiophylla, 294
Coccocypselum, 395
  hirsutum, 395
Coccoloba, 361
  cardiophylla, 361
  chacoensis, 239
Cochlospermum vitifolium, 237
Cologania, 368
  procumbens, 368
Colorín, 264
Columnea, 393
  pilosissima, 393
  rubricaulis, 393
  venusta, 210
Commelina, 322
  coelestis, 322
Commelinaceae, 227, 322
Comparettia, 324
  falcata, 324
Compositae, 224, 284, 399
Conceveiba guyanensis, 416
  Krukoffi, 414
  magnifica, 414
  simulata, 416
Conglomerati, 8
Connaraceae, 365
Connarus, 365
  Lambertii, 365
Conostegia, 382
  subhirsuta, 382
  xalapensis, 383
Convolvulaceae, 206, 388
Corallocarpus hypoleucus, 223
Coreopsis auriculata, 609
  grandiflora, 608, 609
  grandiflora var. Harveyana, 610
  heterogyna, 609
  intermedia, 609
  lanceolata, 609
  Linifolia, 609
  ochracea var. Lugardii, 608
  Oniscicarpa, 609
  pinnatipartita, 593
  pubescens, 609
  pubescens var. robusta, 611
Cormi, 183
Corytholoma, 394
  Warscewiczii, 394
Cosmos, 400
  crithmifolius, 400
Couepia calophlebia, 248
  Dahlgrenii, 248
  habrantha, 249
  Krukovii, 250
  latifolia, 251
  Martiana, 249
Coussapoa araneosa, 158
  boliviana, 159
  cornifolia, 160
  Eggersii, 160
  embirana, 161
  ficina, 161
  Froesii, 162
  hirsuta, 161
  hypochlora, 162
  Krukovii, 163
  Lawrancei, 164
  Lehmannii, 164
  orthoneura, 165
  parvifolia, 165
  rhamnoides, 166
  subcrenata, 166
  villosa, 161
Coussarea Duckei, 274
  Krukovii, 212
  mexicana, 274
Cranichis, 325
  pseudociliata, 325
Crassulaceae, 363
Crinum, 324
  cruentum, 324
Crispi, 8
Croton, 374
  ciliato-glandulosus, 374
  repens, 374
Crucecillo, 274
Cruciferae, 191, 248
Crusea, 395
  calocephala, 395

Ctenidium, 298
  hondurense, 298
  molluscum, 298
Cucurbitaceae, 223, 399
Cuphea, 379
  carthagenensis, 379
  Hookeriana, 379
  utriculosa, 379
Curatella americana, 237
Cuscuta, 388
  strobilacea, 388
Cyathea, 300
  mexicana, 300
Cyatheaceae, 300
Cyperaceae, 314
Cyperus, 314
  cayennensis, 314
  haspan, 314
  incompletus, 314
  prolixus, 314
  surinamensis, 314
  tenerrimus, 314
  unioloides, 314
Cyphomandra, 390
  heterophylla, 390
  mollicella, 390

Dalbergia, 368
  cubilquitzensis, 368
Dama de noche, 268
Darbolia, 457
Declieuxia, 396
  fruticosa var. mexicana, 396
Delphinium calcar-equitis, 244
  valens, 245
Dennstaedtia, 302
  globulifera, 302
  rubiginosa, 302
Densiflori, 7
Dentati, 8
Desmodium, 368
  axillare, 368
  cajanifolium, 368
  frutescens, 368
  Gentryi, 262
  lavanduliflorum, 262
  luteolum, 368
  quercetorum, 263
Dialium, 369
  guianense, 264, 369
Dichaea, 325
  muricata, 325
  trichocarpa, 325
Dichapetalaceae, 196, 373
Dichapetalum, 373
  chiapasense, 196
  Donnell-Smithii, 197, 373
Dicksoniaceae, 300
Dicranopteris, 299
  pectinata, 299
Didymochlaena, 302
  truncatula, 302
Didymopanax Morototoni, 267
Diodia, 396
  brasiliensis var. angulata, 396
Diplazium, 302
  Donnell-Smithii, 302
Distylium, 364
  guatemalense, 364
Dorstenia, 359
  Contrajerva, 359
Drymaria, 362
  villosa, 362
Dryopteris, 302
  denticulata, 302
  effusa var. divergens, 302
  Hemsleyana, 302
  interjecta, 302
  Linkiana, 302
  melanochlaena, 302
  nicaraguensis, 302
  normalis, 302
  oligocarpa, 302
  patula, 302
  paucijuga, 302, 304
  pseudosancta, 302
  resiliens, 302
  resinifera, 304
  subincisa, 304
Drypetes amazonica, 420
  Forbesii, 560
  keyensis, 420
  Phyllanthoides, 562
  variabilis, 420
Dubautia laxa var. pedicellata, 611
  laxa var. Skottsbergii, 611
Dyschoriste, 394
  oaxacensis, 394
Dyssodia puberula, 284

Echeandia parviflora, 229
Echinodorus, 311
  tenellus, 311
Eichhornia, 323
  azurea, 323
Elaphoglossum, 304
  rampans, 304
  rubescens, 304
  scolopendrifolium, 304
  tectum, 304
Eleocharis, 314
  flaccida, 314
  geniculata, 314
  mutata, 314
  nodulosa, 314
  sulcata, 314
Eleusine, 312
  indica, 312
Entodontaceae, 297
Epidendrum, 325
  Brassavolae, 325
  centropetalum, 325
  Chloe, 325
  cobanense, 325
  cochleatum, 325
  difforme, 325

Epidendrum Lindleyanum, 325
  luteoroseum, 325
  ochraceum, 325
  polyanthum, 325
  polyanthum var. myodes, 325
  polybulbon, 325
  pygmaeum, 325
  radicans, 326
  ramosum var. mixtum, 326
  rhynchophorum, 326
  teretifolium, 326
  Tuerckheimii, 326
  virgatum, 326
Epiphyllum, 379
  caudatum, 379
  strictum, 379
Ericaceae, 385
Erigeron, 401
  jamaicensis, 401
  spathulatus, 401
Eriochrysis, 312
  cayennensis, 312
Eriosema, 369
  diffusum, 369
Eryngium, 384
  caricinum, 384
Erythrina, 369
  rubrinervia, 369
Erythrodes, 326
  Tuerckheimii, 326
Escobedia, 392
  laevis, 392
Espuela de caballero, 245
Eugenia, 380
  apodantha, 380
  axillaris, 380
  Banghamii, 381
  Doubledayi, 380
  hiraeifolia, 202
  nesiotica, 203
  vincentina, 380
  Yunckeri, 380
Eupatorium, 401
  ivaefolium, 401
  ligustrinum, 401
  macrocephalum, 401
  morifolium, 401
Euphorbia, 374
  Celastroides var. moomomiana, 477
  graminea, 374
  multiformis var. microphylla, 376
  multiformis var. mohihiensis, 576
Euphorbiaceae, 197, 265, 373
Eurya, 377
  guatemalensis, 377

Fabronia, 297
  flavinervis, 297
Fabroniaceae, 297
Fagaceae, 356
Ficus, 359
  andicola, 167
  Archeri, 167
  costaricana, 359
  Eliadis, 168
  frondosa, 169
  Gameleira, 169
  glabrata, 359
  Gleasonii, 170
  Haughtii, 170
  involuta, 359
  juruensis, 179
  Krukovii, 171
  Lawrancei, 172
  malacocarpa, 172
  Mexiae, 173
  mima, 173
  padifolia, 359
  panurensis, 174
  popayanensis, 174
  radula, 359
  ramiflora, 175
  regularis, 175
  sphenophylla, 176
  Sprucei, 176
  tolimensis, 177
  uberrima, 177
  Urbaniana, 170
  ursina, 178
  velutina, 359
Fimbristylis, 314
  diphylla, 314
Fissidens, 296
  reclinatulus, 296
Fissidentaceae, 296
Flacourtiaceae, 200, 378
Forestiera neomexicana, 206
  neomexicana var. arizonica, 206
  Shrevii, 205
Fraxinus, 386
  hondurensis, 386
Fuirena, 315
  simplex, 315
Funaria, 296
  calvescens, 296
Funariaceae, 296

Galeana, 401
  pratensis, 401
Gameleira, 170
Gaura Gentryi, 203
  grandiflora, 204
  mutabilis, 204
Geniostoma Cyrtandrae, 506
  Remyana, 497
Geniostomoideae, 457
Geniostomoides, 457
Genipa americana, 214
  vulcanicola, 218
Gentianaceae, 387
Gesneriaceae, 210, 393
Gilibertia, 388
  leptopoda, 388
Gleicheniaceae, 299
Gliricidia, 369
  meistophylla, 369

Globulina, 296
  globulifera, 296
Gongora, 326
  cassidea, 326
Gonolobus chihuahuensis, 270
Gonzalagunia, 396
  panamensis, 396
Govenia, 326
  Powellii, 326
Gramineae, 312
Grindelia, 423
  aggregata, 427
  aphanactis, 428, 438, 441
  arenicola, 424, 425, 438
  arenicola var. pachyphylla, 425, 426, 431
  arizonica, 427, 428, 431, 432, 438, 441
  arizonica var. stenophylla, 427
  Blakei, 424, 426, 427, 428, 429, 434, 438, 441
  buphthalmoides, 436
  camporum, 424, 427, 428, 429, 430, 436, 437, 438, 441
  chiloensis, 425, 427
  columbiana, 428, 441
  confusa, 442
  decumbens, 428
  decumbens var. subincisa, 438
  discoidea, 428
  fastigiata, 427, 428, 429, 431
  globularifolia, 425, 427
  glutinosa, 436, 439
  grandiflora, 425, 431, 435, 438, 441
  Greenei, 439
  Greenmanii, 427, 429, 439, 442
  Hallii, 428
  Havardii, 438, 441
  hirsutula, 432, 441
  hirsutula var. brevisquama, 427, 429, 431, 432
  hirsutula f. patens, 429
  hirsutula f. tomentulosa, 432
  humilis, 424, 425, 426, 427, 431, 435, 441
  inornata, 427, 428, 441
  integrifolia, 425, 426, 427, 429, 431, 438, 439
  integrifolia var. virgata, 438, 439
  inuloides, 426, 427, 439, 440, 442
  inuloides var. adenodonta, 438
  inuloides var. glandulosa, 425, 426, 427, 432, 439
  laciniata, 428, 442
  lanceolata, 423, 427, 428, 431, 432, 434, 437, 438, 439, 441
  littoralis, 438, 441
  maritima, 434, 436, 438, 441
  microcephala, 438, 439, 440
  microcephala var. adenodonta, 425, 427, 437, 440, 441, 442
  microcephala var. pusilla, 424
  nana, 426, 427, 429, 431, 435, 436, 437, 441
  nana var. integerrima, 428, 431
  nana var. turbinella, 427, 428
  Nelsonii, 434, 439
  oolepis, 423, 427, 428, 429, 431, 434, 438, 439
  oxylepis, 439, 440, 441
  oxylepis f. capitellata, 428
  oxylepis var. eligulata, 428
  Palmeri, 429, 439, 442
  perennis, 426, 429, 431, 435, 441
  procera, 424, 427, 436, 441
  revoluta, 431
  Robinsonii, 428, 434, 439, 442
  rubricaulis, 432
  rubricaulis var. bracteosa, 428
  rubricaulis var. elata, 438
  rubricaulis var. latifolia, 426, 437, 438
  rubricaulis var. robusta, 426, 427, 428, 436, 438, 441
  scabra, 432, 439
  scabra var. neomexicana, 429, 436, 438, 439
  squarrosa, 423, 426, 427, 428, 429, 431, 432, 434, 435, 436, 440, 441
  squarrosa f. depressa, 424
  squarrosa var. nuda, 425, 426, 427, 428
  squarrosa var. serrulata, 426
  stricta, 425, 426, 429, 432, 435
  stricta var. Hendersoni, 424, 432
  stricta var. lanata, 432
  stricta var. macrophylla, 426, 427, 429, 431, 434
  stricta var. procumbens, 425, 426
  subalpina, 426, 429, 437, 439, 441
  subalpina var. erecta, 428, 437, 439, 441
  subdecurrens, 439, 440, 442
  sublanuginosa, 440, 441
  tenella, 428, 434, 439, 441
  texana, 425, 427, 436, 438, 439, 440
Gronovia scandens, 201
Guapaqui, 264
Guatteria, 363
  grandiflora, 363
Guazuma ulmifolia, 201
Guettarda boliviana, 275
  Duckei, 275
Gutierrezia, 423
Guttiferae, 377

Habenaria, 326
  clypeata, 326
  crassicornis, 326
  novemfida, 326
  setifera, 326
Halogeton sativus, 240
Hamamelidaceae, 192, 364
Hamamelis macrophylla, 193
  mexicana, 192
  vernalis, 193
  virginiana, 193

Hamelia, 396
  patens, 396
Hasseltia guatemalensis, 200
Hauya Barcenae, 204
  Lundellii, 204
Hecistopteris, 304
  pumila, 304
Hedychium, 324
  coronarium, 324
Hedyosmum, 356
  Artocarpus, 356
Heliconia, 324
  librata, 324
  pendula, 324
Heliotropium, 389
  angiospermum, 389
  indicum, 389
Hemionitis, 304
  pinnatifida, 304
Hemitelia, 300
  costaricensis, 300
Heteranthera, 323
  limosa, 323
  reniformis, 323
Hieracium, 401
  hondurense, 401
Hierba de leche, 266
Higo del monte, 159
Hippotis albiflora, 214
  mollis, 214
Hirtella americana var. *oblongifolia*, 252
  Duckei, 251
  egensis, 251
  oblongifolia, 252
  physophora, 252
  purusana, 252
  racemosa var. oblongifolia, 252
  rasa, 252
  scabra, 253
  Sprucei, 253
Hoffmannia, 396
  angustifolia, 396
  gesnerioides, 396
  Lawrancei, 275
  macrosiphon, 276
  nebulosa, 396
  riparia, 214
Hybanthus, 378
  oppositifolius, 378
Hydrocotyle, 384
  umbellata, 384
Hydrolapatha, 8
Hymenocallis sonorensis, 229
Hymenophyllaceae, 299
Hymenophyllum, 299
  asplenoides, 299
  fucoides, 299
  polyanthos, 300
Hymenosepali, 7
Hypericum, 377
  uliginosum, 377
Hypnaceae, 298

Hyptis, 390
  asperifolia, 390

Ilex, 374
  hondurensis, 374
  Rimbachii, 198
  tolucana, 375
Ilysanthes, 392
  inaequalis, 392
Indigofera, 369
  suffruticosa, 369
Inga, 369
  cobanensis, 369
Ionopsis, 326
  utricularioides, 326
Ipomoea, 389
  cathartica, 389
  Chilopsidis, 206
  digitata, 389
  muricata, 389
  silvicola, 389
Iresine Cardenasii, 241
Iridaceae, 229, 324
Isochilus, 326
  linearis, 326
Isopterygium, 298
  tenerum, 298
Ixora faroensis, 277
  Martinsii, 277

Jacquemontia luxurians, 206
Jarilla Chocola, 200
Jatropha, 374
  Curcas, 374
João Mole, 189
Jussiaea, 383
  linifolia, 383
  peruviana, 383
  repens, 383
  suffruticosa, 383

Kapiáh, 201, 202
Krameriaceae, 365
Krameria cuspidata, 365
Kumaka-balli, 170, 173

Labiatae, 208, 272, 390
Labordeae verae, 456
Labordia, 455
  Baillonii, 510
  Cyrtandrae, 506
  Cyrtandrae var. β nahikuana, 509
  decurrens, 542
  Degeneri, 513
  Degeneri var. β subcarinata, 514
  Echitis, 510
  Fagraeoidea, 472, *491*, *497*
  Fagraeoidea var. γ conferta, 476
  Fagraeoidea var. κ Hillebrandii, 484
  Fagraeoidea var. κ Hillebrandii f. l. subcalva, 485
  Fagraeoidea var. β Humei, 474
  Fagraeoidea var. β Humei f. l. paniculata, 476

- Labordia Fagraeoidea var. δ jugorum, 477
  - Fagraeoidea var. θ longisepala, 483
  - *Fagraeoidea* var. *pumila*, 489
  - Fagraeoidea var. η Saint-Johniana, 483
  - Fagraeoidea var. ι septentrionalis, 484
  - Fagraeoidea var. ε sessilis, 478
  - Fagraeoidea var. ε sessilis f. l. glabrescens, 481
  - Fagraeoidea var. λ simulans, 486
  - Fagraeoidea var. ζ waianaeana, 482
  - Fauriei, 542
  - glabra, 504
  - glabra var. γ latisepala, 506
  - glabra var. β orientalis, 505
  - *Grayana*, 491, 497, 498
  - *Grayana* var. *centralis*, 494
  - Hedyosmifolia, 491
  - Hedyosmifolia var. β centralis, 494
  - Hedyosmifolia var. ε Grayana, 497
  - Hedyosmifolia var. ι Hosakana, 500
  - Hedyosmifolia var. η kilaueana, 499
  - Hedyosmifolia var. θ magnifolia, 499
  - Hedyosmifolia var. δ robusta, 496
  - Hedyosmifolia var. γ Rockii, 496
  - Hedyosmifolia var. ζ Skottsbergii, 498
  - Helleri, 526
  - Helleri var. β macrocarpa, 527
  - hirtella, 516
  - hirtella var. ε haleakalana, 520
  - hirtella var. ζ hispidior, 521
  - hirtella var. θ imbricata, 521
  - hirtella var. η laevis, 521
  - hirtella var. ι laevisepala, 522
  - hirtella var. δ microcalyx, 519
  - hirtella var. β microphylla, 518
  - hirtella var. γ sororia, 519
  - *hypoleuca*, 506
  - kaalae, 538
  - kaalae var. γ brachypoda, 540
  - kaalae var. β Fosbergii, 539
  - kaalae var. ε kauaiensis, 541
  - kaalae var. δ mendax, 541
  - *lophocarpa*, 466, 467
  - lophocarpa var. *phyllocalyx*, 468
  - *lophocarpa* var. *pluriflora*, 464
  - Lydgatei, 525
  - mauiensis, 504
  - membranacea, 511, *515*
  - membranacea var. β exigua, 512
  - molokaiana, 464
  - molokaiana var. η Bryanii, 471
  - molokaiana var. ε congesta, 470
  - molokaiana var. β lophocarpa, 466
  - molokaiana var. γ Munroi, 467
  - molokaiana var. δ phyllocalyx, 468
  - molokaiana var. ζ setosa, 470
  - olympiana, 515
  - pallida, 486
  - *pallida* f. *alpina*, 489
  - pallida var. β hispidula, 488
  - pedunculata, 488
  - pumila, 489
  - *Remyana*, 497
  - *sessilis*, 478
  - Tinifolia, 526, 529
  - Tinifolia var. ζ Euphorbioidea, 536
  - Tinifolia var. η Forbesii, 536
  - Tinifolia var. κ honolulensis, 538
  - Tinifolia var. ε lanaiensis, 535
  - Tinifolia var. γ leptantha, 533
  - Tinifolia var. θ microgyna, 537
  - Tinifolia var. β parvifolia, 532
  - Tinifolia var. ι tenuifolia, 537
  - Tinifolia var. δ waialuana, 534
  - triflora, 538
  - venosa, 502
  - waialealae, 522
  - *waiolanii*, 468
  - Wawrana, 503
- Lagenaria, 399
  - siceraria, 399
- Lantana, 389
  - Camara, 389
  - involucrata, 389
- Lapathum, 6
- Lasiacis, 312
  - divaricata, 312
  - procerrima, 312
- Lauraceae, 247, 363
- Leersia, 312
  - hexandra, 312
- Leguminosae, 195, 261, 365
- Leiphaimos, 387
  - parasiticus, 387
- Lentibulariaceae, 392
- Lepanthes, 327
  - acuminata, 327
  - Dawsonii, 327
  - eximia, 328
  - Yunckeri, 327
- Lepanthopsis, 328
  - floripecten, 328
- Lepidium macrum, 248
- Leucobryaceae, 296
- Liatris, 423
- Licania anisophylla, 253
  - aspera, 254
  - *Britteniana*, 257
  - celativenia, 254
  - Dahlgrenii, 255
  - elliptica, 255
  - emarginata, 259
  - *Hookeri*, 258
  - intrapetiolaris, 257
  - Krukovii, 256
  - latifolia, 257
  - macrophylla, 257
  - micrantha, 254
  - oblongifolia, 257
  - obovata, 257
  - pallida, 257
  - riparia, 258
  - stenocarpa, 258
- Lichenes, 294

Liliaceae, 228, 323
Limnanthemum, 387
  Humboldtianum, 387
Lindsaya, 305
  quadrangularis, 305
Lipocarpha, 315
  maculata, 315
Lipochaeta dubia, 580
  lavarum, 581
  lavarum var. conferta, 582
  lavarum var. lanaiensis, 582
  lavarum var. maneleana, 583
  lavarum var. Stearnsii, 581
Lippia, 390
  barbata, 208
  dulcis, 390
  Gentryi, 207
  Kellermanii, 390
Liquidambar, 364
  Styraciflua, 364
Litsea, 363
  glaucescens, 363
  Tharpiana, 247
Lobaria, 294
  conformis, 294
Lobelia, 399
  splendens, 399
Lobeliaceae, 399
Loganiaceae, 386
Lonchocarpus Lindsayi, 195
Loranthaceae, 236, 360
Lycianthes, 390
  sideroxyloides, 390
Lycopodiaceae, 310
Lycopodium, 310
  arcanum, 310
  cernuum, 311
  reflexum, 311
  stamineum, 311
  Tuerckheimii, 311
Lygodium, 299
  polymorphum, 299
Lythraceae, 379

Mabea caudata, 419
  elata, 418
  fistuligera, 417
  Klugii, 416
  parvifolia, 419
  Piriri, 417, 419
  Piririoides, 419
  pulcherrima, 419
  speciosa, 418, 419
  Standleyi, 417
  subserrulata, 419
  Taquari, 417
  Trianae, 417
Macrocnemum cuencanum, 215
  vestitum, 215
Macromitrium, 296
  longifolium, 296
  mucronifolium, 296
  Podocarpi, 296
  Sumichrasti, 296
Mahoy píwala, 272
Malaxis, 328
  aurea, 328
  Maxonii, 328
  Parthonii, 328
Malpighia, 373
  glabra, 373
Malpighiaceae, 372
Malvaceae, 198, 376
Malvaviscus, 376
  arboreus, 376
Mandevilla, 387
  tubiflora, 387
Manettia capitata, 216
  cephalophora, 216
  Miersiana, 216
Manihot isoloba, 197
Mano de danto, 267
Mapaty, 181, 184
Marantaceae, 324
Marattia, 299
  excavata, 299
Marattiaceae, 299
Marcgravia, 377
  rectiflora, 377
Marcgraviaceae, 377
Maritimi, 8
Marsilea, 310
Marsiliaceae, 310
Matapalo, 161, 168, 237
Matapau, 173
Maxillaria, 328
  uncata, 328
  variabilis, 328
Maxonia, 305
  apiifolia var. dualis, 305
Melampodium, 401
  brachyglossum, 401
Melastomaceae, 381
Melia, 372
  Azedarach, 372
Meliaceae, 372
Mendoncia albida, 421
  hirsuta, 421
  Killippii, 421
  Mello-Barretoana, 421
  puberula, 421
Menispermaceae, 362
Menyanthaceae, 387
Merinthopodium, 391
  neuranthum, 391
Metastelma, 387
  pedunculare, 387
Meteoriaceae, 297
Miconia, 383
  albicans, 383
  globulifera, 388
  humilis, 383
  longifolia, 383
  Schlechtendalii, 383
Micromitrium, 296
  fragile, 296

Mikania, 401
  Tonduzii, 401
Millea, 199
  ecuadorensis, 199
Mimosa, 369
  albida, 369
  pigra, 369
  pudica, 369
Mirabilis, 361
  Jalapa, 361
  longipes, 242
  Muelleri, 241
Mittenothamnium, 298
  diminutivum, 298
  Lehmanii, 298
Monarda Bartlettii, 208
  Eplingiana, 208
  Pringlei, 208, 209
Monimiaceae, 363
Monotropa, 384
  coccinea, 384
Monstera, 318
  pertusa, 318
Moquilea elata, 257, 258
  pallida, 258
  riparia, 258
Moraceae, 156, 235, 359
Morinda panamensis, 278
Mortoniodendron, 411
  anisophyllum, 411
Morus, 359
  multicaulis, 359
Muhlenbeckia chilensis, 31
Muiratinga, 157, 187
Murure, 158, 187
Musaceae, 324
Musci, 296
Myrica, 356
  mexicana, 356
Myricaceae, 356
Myriocarpa, 360
  yzabalensis, 360
Myrsinaceae, 385
Myrtaceae, 202, 379

Nectandra, 363
  sanguinea, 363
  surinamensis, 363
Neea aeruginosa, 187
  Krukovii, 188
  madeirana, 189
  Mexiae, 187
Neowawraea, 562
  Phyllanthoides, 562
Nephrolepis, 305
  cordifolia, 305
  pendula, 305
Nisperillo, 171
Notylia, 328
  trisepala, 328
Nyctaginaceae, 187, 241, 361

Obtusifolii, 8
Ochnaceae, 377
Ochroma concolor, 266
Octoblepharum, 296
  albidum, 296
Odontosoria, 305
  Schlechtendalii, 305
Ojoche blanco, 235
  de hoja menuda, 235
Ojochillo, 235
Oleaceae, 205, 386
Olmedia boyacana, 179
  tovarensis, 179
Olmediella, 378
  Betschleriana, 378
Onagraceae, 203, 383
Oncidium, 329
  carthaginense, 329
  graminifolium, 329
  leucochilum, 329
Ophioglossaceae, 299
Ophioglossum, 299
  crotalophoroides, 299
  reticulatum, 299
Orchidaceae, 324
Oreopanax, 384
  artocarpoides, 205
  Liebmannii, 384
  peltatum, 384
  Salvinii, 384
  xalapense, 384
Ormosia isthmensis, 264
Orthopappus, 401
  angustifolius, 401
Orthotrichaceae, 296
Osmunda, 299
  cinnamomea, 299
  regalis, 299
Osmundaceae, 299
Ostrya, 356
  virginiana var. guatemalensis, 356
Oxalidaceae, 371
Oxalis, 371
  latifolia, 371
  Neaei, 371

Pagamea capitata, 279
  coriacea, 279
  Duckei, 278
  guianensis, 279
  guianensis var. pilosa, 279
  guianensis var. typica, 279
  hirsuta, 279
  plicata, 278
  thyrsiflora, 280
Pajurá, 258
Pajurá-rana, 354
Palicourea, 397
  affinis, 216
  Galeottiana, 397
  roraimae, 280
  verrucosa, 217
Palmae, 316
Panicum, 313

Panicum arenicoloides, 313
  laxum, 313
  maximum, 313
  sphaerocarpon, 313
Pannaria, 294
  lurida, 294
Pannariaceae, 294
Papillaria, 297
  nigrescens, 297
Paqui, 264
Parathesis, 385
  Donnell-Smithii, 385
Parinarium *pilosum*, 259
Parkinsonia, 369
  aculeata, 369
Parmelia, 295
  americana, 295
  capitata, 295
  cristifera, 295
  latissima, 295
  pseudoflavescens, 295
  subrugata, 295
  tinctorum, 295
Parmeliaceae, 295
Parosela, 370
  scoparia f. Arsenei, 195
  sericea, 370
Paspalum, 313
  notatum, 313
  plenum, 313
  virgatum, 313
Passiflora, 378
  ciliata, 378
  foetida var. gossypiifolia, 378
Passifloraceae, 378
Pata de gallo, 197
Patientiae, 7
Pectis, 401
Pelexia, 329
  hondurensis, 329
Peltigera, 294
  polydactyla, 294
Peltigeraceae, 294
Pennisetum, 313
  setosum, 313
Pentagonia grandiflora, 217
Pentarrhaphis, 313
  scabra, 313
Pentstemon Gentryi, 209
Peperomia, 330
  aggravescens, 330
  amnicola, 330
  argumentosa, 331
  caducipilosa, 331
  chicbulana, 230
  chucanebana, 331
  circulifolia, 331
  circulifolia var. eciliata, 332
  circulifolia var. flava, 331
  collocata, 332
  condormiens, 332
  conocarpa, 332
  Dawsoni, 333
  defluens, 333
  eripipunctulata, 333
  filici-decorans, 333
  flagitans, 334
  inaudax, 334
  lancetillana, 334
  lancetillana var. spathifolia, 335
  laudabilis, 335
  longiacuminata, 335
  mala, 335
  mollipubis, 335
  montis-verticis, 336
  nebuligaudens, 336
  novae-hispaniae, 336
  novella, 336
  opaca var. ciliata, 336
  perplexa, 337
  petenensis, 230
  petenensis var. hondurensis, 337
  praeteruentifolia, 337
  rhodophlebia, 337
  rinconensis, 337
  rotundifolia, 338
  rubefacta, 338
  suavis var. hondurensis, 338
  subgeminispica, 338
  tressis, 339
  Trumani, 339
  yojoana, 339
  Yousei, 339
  Yunckeri, 340
Perebea concinna, 179
  xinguana, 180
Perezia, 401
  nudicaulis, 401
Pharus, 313
  latifolius, 313
Phaseolus, 370
  anisotrichus, 370
Philonotis, 296
  tenella, 296
Phoebe, 363
  helicterifolia, 363
  mexicana, 363
Phoradendron, 360
  aurantiacum, 236
  commutatum, 360
  franciscanum, 236
  libertadanum, 236
  petenense, 237
  piperoides, 360
  yojoanum, 360
  Yunckeri, 360
Photinia, 364
  microcarpa, 364
Phyllanthus distichus, 563
  lathyroides, 266
  nivosus, 568
  Purpusii, 197
  sandwicensis, 563
  sandwicensis var. Degeneri, 567
  sandwicensis var. Degeneri f. rufidus, 568

Phyllanthus sandwicensis var. ellipticus, 565
  sandwicensis f. grandifolia, 563
  sandwicensis var. *hypoglaucus*, 568
  sandwicensis var. *oblongifolius*, 563
  sandwicensis f. parvifolius, 565
  Williamsii, 266
Phyllostegia mollis var. Lydgatei, 578
  mollis var. Skottsbergii, 577
Physalis, 391
  caudella, 273
  eximia, 273
  ingrata, 391
Physcia, 295
  segilata, 295
  syncolla, 295
Physciaceae, 295
Phytolacca, 361
  Meziana, 361
  rivinoides, 361
Phytolaccaceae, 361
Picramnia, 372
  andicola, 372
  locuples, 372
Pié de gallo, 267
Pinaceae, 311
Pinus, 311
  oocarpa, 311
  pseudostrobus, 311
Piper, 340
  actae, 340
  adornatispicum, 340
  aduncum, 347
  allatum, 341
  andresense, 230
  andresense var. subcalvescens, 231
  angustifolium, 347
  apertum, 341
  apertum var. nodosum, 341
  arenicola, 341
  auritum var. amplifolium, 342
  auritum f. rinconense, 342
  calvescens, 342
  calvescens var. pedunculatum, 342
  calvescens var. portrerillosense, 343
  colaphitolerans, 231
  comayaguanum, 343
  cristicola, 343
  curvatipes, 231
  Dawsoni, 343
  Deamii, 344
  Deamii var. yojoanum, 344
  deltoideocarpum, 344
  discolor, 231
  elongatum, 347
  emancipationis, 231
  emancipationis var. longum, 232
  epilosipes, 344
  epilosipes var. heterophyllum, 345
  exigens, 345
  exigens var. subovatum, 345
  faviculiferum, 345
  firmifolium, 346
  fraguanum var. viride, 346
  inconsumptum, 346
  instabilipes, 232
  laceratibracteum, 346
  laedans, 347
  Lundellianum, 232
  monteluctans, 347
  multinervium, 347
  multinervium var. amplum, 347
  multinervium var. cayoense, 347
  multinervium var. flavicans, 348
  multinervium var. hirsuticaule, 348
  multinervium var. kantelolense, 348
  multinervium var. paralense, 348
  multinervium var. peracutum, 349
  multinervium var. productipes, 349
  multinervium var. protractifolium, 349
  multinervium var. puberulipedunculum, 347
  multinervium var. pubescenticaule, 350
  multinervium var. Skutchii, 350
  multinervium var. tamashense, 350
  multinervium var. telanum, 350
  mystaciferum, 350
  nitidulilaminum, 232
  nubigaudens, 351
  ornatispicum, 351
  paludicola, 351
  petens, 352
  pictamentum, 352
  pictamentum var. fluminis, 352
  plumbeicolor, 233
  praemollitum, 352
  quadratilimbum, 233
  rematense, 233
  rinconense, 353
  roseovenulosum, 353
  scabriseptum var. reductum, 353
  scalarispicum, 353
  siguatepequense, 354
  siguatepequense var. subrhombifolium, 354
  simulhabitans, 233
  tenuiculispicum, 354
  tesseraespicum, 354
  tikalense, 234
  viae-marginis, 355
  xanthocladum, 347
  yalochanum, 234
  yaxhanum, 234
  Yousei, 355
  Yunckeri, 355
  Yunckeri var. latum, 355
Piperaceae, 230, 330
Piratinera panamensis, 235
Piscidia, 370
  grandifolia, 370
Pitcairnia, 318
Pithecolobium, 370
  arboreum, 370
Pityrogramma, 305

Pityrogramma calomelaena, 305
  Schaffneri, 305
  tartarea, 305
Plantaginaceae, 394
Plantago, 394
  Galeottiana, 394
Pleurothallis, 329
  Carioi, 329
  fuegii, 329
  hirsuta, 329
  Johnsonii, 329
  pansamalae, 329
Plocaniophyllon flavum, 217
Plukenetia angustifolia, 265
Pogonopus speciosus, 218
Polopolo, 200
Polygala, 373
  glochidiata, 373
  incarnata, 373
  longicaulis, 373
Polygalaceae, 373
Polygonaceae, 239, 361
Polygonum, 361
  amphibium, 68
  hispidum, 361
  punctatum, 361
Polymnia, 401
  maculata, 401
  oaxacana, 401
Polypodiaceae, 301
Polypodium, 305
  angustifolium, 305
  angustum, 305
  apiculatum, 305
  asplenifolium, 305
  astrolepis, 305
  carpinterae, 305
  crassifolium, 306
  cryptocarpon, 306
  cultratum, 306
  delitescens, 306
  dissimile, 306
  fraternum, 306
  induens, 306
  leucosticton, 307
  Lindenianum, 306
  loriceum, 306
  montigenum, 306
  plebeium, 307
  plumula, 308
  polypodioides, 308
  rhodopleuron, 308
  trichomanoides, 308
  triseriale, 308
Polystachya, 329
  luteola, 329
  minor, 329
Polystichum, 308
  platyphyllum, 308
Polytrichaceae, 298
Pontederiaceae, 323
Pooczuyaax, 232
Potentilla exsul, 259
  leonina, 260
  Mexiae, 260, 261
Pottiaceae, 296
Pourouma elliptica, 181
  ferruginea, 181
  isophlebia, 182, 186
  Lawrancei, 183
  longipendula, 185
  Mildbraediana, 183
  populifolia, 184
  subplicata, 184
  umbellata, 185
Priva aspera, 201
Prunus Capuli, 194
  Gentryi, 194
  novoleontis, 194
  rhamnoides, 195
  virens, 194
Pseudolmedia Krukovii, 186
  Murure, 186
Psidium, 381
  Guajava, 381
  molle, 381
  Oerstedeanum, 381
Psychotria, 397
  chaponiana, 280
  crebrinervia, 397
  erythrocarpa, 397
  involucrata, 397
  Krukovii, 218
  Lawrancei, 281
  limonensis var. angustifolia, 282
  microdon, 397
  patens, 397
  paulina, 219
  Recordiana, 282
  Skutchii, 283
  trichotoma, 397
  uliginosa, 397
  verrucosa, 217
  Yunckeri, 397
Pteridium, 308
  aquilinum var. Feei, 308
  aquilinum var. lanuginosum, 309
Pteris, 309
  Feei, 308
  orizabae, 309
  propinqua, 309
  quadriaurita, 309
Pyrolaceae, 384

Quercus, 356
  achoteana, 356
  achoteana var. sublanosa, 356
  amissaeloba, 357
  Dawsoni, 357
  perseaefolia var. anchoteana, 357
  pertessellata, 357
  tenuiaristata, 358
  trichodonta, 358
  Yousei, 358
  Yunckeri, 358

Rabdolia, 456
Ramalina, 295
  alludens, 295
  attenuata, 295
  yemensis, 295
Randia, 398
  aculeata, 398
  mollifolia, 219
  Watsoni, 219
Ranunculaceae, 244, 362
Ranunculus centellifolius, 245
  palmifolius, 246
  pentodontus, 247
Rauia, 297
  subcatenulata, 297
Reichenbachia hirsuta, 190
  colombiana, 189
Renealmia, 324
  aromatica, 324
Restrepia, 329
  xanthophthalma, 329
Retiniphyllum cearense, 220
  erythranthum, 220
Rhacoma, 375
  eucymosa, 375
Rhacopilaceae, 297
Rhacopilum, 297
  tomentosum, 297
Rhaphidorrhynchium, 297
  Lindigii, 297
Rhipidopteris, 309
  peltata, 309
Rhipsalis, 379
  Cassutha, 379
Rhizogoniaceae, 297
Rhizogonium, 297
  spiniforme, 297
Rhus, 374
  terebinthifolia, 374
Rhynchosia, 370
  pinetorum, 370
  rariflora, 264
Richeria grandis, 420
  laurifolia, 420
  obovata, 420
  racemosa, 420
  submembranacea, 419
Rivina humilis, 201
Roble blanco, 267
Rondeletia, 398
  amoena, 398
  buddleoides, 398
  nebulosa, 398
  strigosa, 398
Rosaceae, 194, 248, 364
Rottboellia, 313
  aurita var. stigmosa, 313
Rubiaceae, 211, 274, 394
Rubus, 365
  adenotrichos, 365
  miser, 365
Rudgea Garciana, 220
  Krukovii, 221
  palmarum, 221
  paniculata, 221
  singularis, 222
Rumex Acetosa, 22
  Acetosa var. *auriculatus*, 23
  Acetosella, 18
  Acetosella subsp. angiocarpus, 19
  Acetosella f. integrifolius, 22
  Acetosella × *salicifolius*, 60
  acutus, 124
  adscendens, 149
  alpinus, 95, 99
  altissimus, 44
  altissimus var. abortivus, 49
  americanus, 150
  angustatus, 150
  angustifolius, 80
  angustissimus, 22
  aquaticus, 102
  arcticus, 107
  arizonicus, 90
  Bakeri, 93, 102
  balcanicus, 95
  Berlandieri, 52, *132*
  Brittanica, 45, 123
  Brittanica aquaticus, 124
  Brittanica var. borealis, 127
  Brittanica β polygonifolius, 45
  Brittanica × crispus, 147
  bucephalophorus, 147
  californicus, 85
  chrysocarpus, 55
  Claytoni, 150
  confinis, 112
  conglomeratus, 121
  crassus, 79
  crispatulus, 127
  crispo-obtusifolius, 148
  crispus, 116
  crispus × obtusifolius, 148
  crispus × pulcher, 149
  crispus × *salicifolius*, 60
  cuneifolius, 88
  densiflorus, 92
  dentatus subsp. Klotzschianus, 131
  dissimilis, 147
  domesticus, 100, 102
  domesticus β nanus, 108
  dumosus × *salicifolius*, 149
  dumosus × triangulivalis, 149
  ellipticus, 49
  elongatus, 102
  Engelmannii, 30
  Engelmannii β Geyeri, 24
  fascicularis, 42
  fenestratus, 110
  fenestratus var. labradoricus, 115
  fenestratus var. procerus, 114
  flexicaulis, 134
  floridanus, 39, *54*
  fueginus, 136
  fueginus var. athrix, 143
  fueginus var. brachythrix, 143

Rumex fueginus var. ovato-cordatus, 143
  fueginus var. tanythrix, 143
  fueginus var. typicus, 143
  Geyeri, 24
  Goethartii, 150
  gracilipes, 102
  graminifolius, 21, *22*
  hastatulus, 28
  hastulatus, 31
  hesperius, 64
  heterophyllus, 150
  hydrolapathum var. *americanus*, 124
  hymenosepalus, 89
  hymenosepalus var. eu-hymenosepalus, 92
  hymenosepalus var. salinus, 92
  integrifolius, 150
  Kunthianus, 150
  Kunthii, 150
  lacustris, 65
  lacustris f. aquatilis, 65
  lacustris f. terrestris, 66
  Langloisii, 54
  longifolius, 102, 150
  longifolius β nanus, 108
  ludovicianus, 150
  macranthus, 35
  maritimus, 137, 147
  maritimus var. *fueginus*, 137
  mexicanus, 55, 60, 78
  mexicanus var. strictus, 65
  obtusifolius, 127
  occidentalis, 100, 102, 112
  occidentalis var. *nanus*, 108
  orbicularis, 124
  orthoneurus, 96
  pallidus, 71
  paraguayensis × *salicifolius*, 150
  paraguayensis × *triangulivalis*, 149
  Patientia, 115
  Patientia subsp. eu-Patientia, 115
  Patientia subsp. orientalis, 115
  paucifolius, 23
  paucifolius var. gracilescens, 27
  persicarioides, 137, 144
  polygamus, 150
  polyrhizus, 102
  praecox, 99
  procerus, 114
  pulcher, 129
  pulcher subsp. anodontus, 131
  pulcher subsp. divaricatus, 130
  pulcher subsp. eu-pulcher, 130
  pycnanthus, 95
  Romassa, 54
  Rugelii, 128
  salicifolius, 60, 70, 76, 80, 82, 86
  salicifolius var. *angustifolius*, 76
  salicifolius subsp. *angustivalvis* var. *unigranis*, 84
  salicifolius var. *denticulatus*, 86
  salicifolius var. montigenitus, 79, 88
  salicifolius subsp. *triangulivalvis*, 60
  salinus, 92
  sanguineus, 123, 124
  Saxei, 90
  Schultzii, 150
  sibiricus, 74
  spiralis, 43
  subalpinus, 96
  sylvaticus, 150
  thyrsiflorus, 23
  transitorius, 68
  transitorius var. monotylos, 71
  triangulivalvis, 58
  triangulivalvis var. oreolapathum, 64
  tuberosus, 92
  utahensis, 76
  venosus, 31
  verticillatus, 35
  violascens, 131
Rutaceae, 195, 371
Rynchospora, 315
  barbata, 315
  cephalotes, 315
  corymbosa, 315
  cyperoides, 315
  dives, 315
  locuples, 315
  polyphylla, 315
  robusta, 315

Salicifolii, 7
Salsola sativa, 240
Salvia, 390
  siguatepequensis, 390
Sapindaceae, 375
Sapotaceae, 385
Sapranthus, 363
  microcarpus, 363
Sapuchi de la sierra, 219
Saracha, 391
  procumbens, 391
Sarcoglottis, 329
  picta, 329
Saurauia, 376
  leucocarpa, 376
  villosa, 376
Sauvagesia, 377
  tenella, 377
Schizaeaceae, 299
Schlotheimia, 297
  Mohriana, 297
  Sartorii, 297
Schoenocaulon, 323
  officinale, 323
Schomburgkia, 329
  tibicinis, 329
Scleria, 316
  pterota var. melaleuca, 316
  secans, 316
Scrophulariaceae, 209, 392
Selaginella, 311
  cuspidata, 311
  cuspidata var. elongata, 311

Selaginella guatemalensis, 311
  huehuetenangensis, 311
Selaginellaceae, 311
Selenia dissecta, 191, 422
  grandis, 422, 443
  Jonesii, 422
  mexicana, 191, 422
  oinosepala, 422, 443
Sematophyllaceae, 297
Sematophyllum, 297
  caespitosum, 297
  cuspidiferum, 297
  galipense, 297
Senecio, 402
  arborescens, 402
Setaria, 313
  geniculata, 313
Sida, 376
  ciliaris, 376
  linifolia, 376
Silene chihuahuensis, 190
Simarubaceae, 372
Simplices, 7
Siparuna, 363
  nicaraguensis, 363
Sisyrinchium, 324
  alatum, 324
  Johnstonii, 229
  tinctorium, 229
Sloanea anisophylla, 411
Smilacaceae, 323
Smilacina, 323
  paniculata, 323
Smilax, 323
  subpubescens, 323
Sobralia, 329
  macrantha, 329
Solanaceae, 273, 390
Solanum, 391
  aculeatissimum, 391
  bicolor, 391
  erythrotrichum, 391
  guanicense, 391
  laurifolium, 392
  madrense, 392
  nigrum, 392
  nudum, 392
  Seaforthianum, 392
  umbellatum, 392
Solenophora Wilsonii, 210
Sonchus, 402
  oleraceus, 402
Sorghastrum, 313
  nutans, 313
Souroubea, 377
  guianensis, 377
Spananthe, 384
  paniculata, 384
Spathiphyllum, 318
  Friedrichsthalii, 318
Sphyrospermum, 385
  majus, 385
Spigelia, 386
  Humboldtiana, 386
Sporobolus, 313
  indicus, 313
Stachys, 390
  guatemalensis, 390
Stanhopea, 330
  ecornuta, 330
Staphyleaceae, 375
Stelis, 330
  hymenantha, 330
  thecoglossa, 330
Stenochlaena, 309
  vestita, 309
Stenogyne Calaminthoides, 579
  Cranwelliae, 578
  microphylla, 578
Stenophyllus, 316
  hirtellus, 316
Sticta, 294
  clathrata, 294
  laciniata, 294
  Pickeringii, 294
Stictaceae, 294
Stictina, 294
  carpoloma, 294
Stigmaphyllon, 373
  ellipticum, 373
  puberum, 373
Struthanthus, 361
  cassythoides, 361
  densiflorus, 361
  guatemalensis, 237
  orbicularis, 361
Struthiopteris, 309
  polypodioides, 309
  varians, 309
Styracaceae, 386
Styrax, 386
  argenteus, 386
  glabrescens, 386

Tagetes, 402
  filifolia, 402
  Schiedeana, 402
Tectaria, 310
  dilacerata, 310
Ternstroemia, 377
  Tepezapote, 377
Tetrorchidium rotundatum, 265
Thalictrum, 362
  hondurense, 362
  guatemalense, 362
Theaceae, 377
Thecophyllum, 319
  montanum, 319
  Werckleanum, 319
Thibaudia, 385
  costaricensis, 385
Thuidiaceae, 297
Thuidium, 297
  delicatulum, 297
Thymophylla puberula, 284
Tibouchina, 383

Tibouchina longifolia, 383
Tillandsia, 319
  Butzii, 319
  cyanea, 319
  excelsa, 319
  fasiculata, 319, 321
  festucoides, 319
  glossophylla, 319
  grandis, 320
  juncea, 320
  lampropoda, 320
  Leiboldiana, 321
  Makoyana, 321
  multicaulis, 321
  polystachya, 321
  prodigiosa, 322
  pruinosa, 321
  punctulata, 321
  recurvata, 321
  Schiedeana, 321
  Standleyi, 321
  usneoides, 321
  vestita, 321
  Walteri, 320
  Yunckeri, 322
Tinantia, 322
  erecta, 322
Tocoyena bullata, 284
  hispidula, 283
  megistantha, 223
Torrubia asperula, 242
  Hoehnei, 242
  Loefgrenii, 243
Tournefortia, 389
  glabra, 389
  hirsutissima, 389
  volubilis, 389
Tradescantia, 323
  chihuahuensis, 227
  collina, 228
  elongata, 323
  semisomna, 228
Trichilia, 372
  havanensis, 372
Tricholaena, 313
  rosea, 313
Trichomanes, 300
  capillaceum, 300
  montanum, 300
  radicans, 300
  rigidum, 300
Tridax, 402
  procumbens, 402
Tripsacum, 314
  dactyloides, 314
Trophis, 360
  chorizantha, 360
Turpinia, 375
  paniculata, 375

Ulmaceae, 234, 359
Ulmus LeSueurii, 235
Umbelliferae, 384
Uniola, 314
  Pittieri, 314
Urticaceae, 360
Usneaceae, 295
Utricularia, 392
  mixta, 392
  pusilla, 392

Valeriana, 399
  scorpioides, 399
Valerianaceae, 399
Vanilla, 330
  pompona, 330
Venosi, 7
Verbena, 390
  carolina, 390
  littoralis, 390
Verbenaceae, 206, 389
Verbesina, 402
  Oerstediana, 403
  Oerstediana var. glabrior, 404
  pleistocephala, 403
  vicina, 402
Vernonia, 405
  melanocarpa, 405
  Taylorae, 224
Verticillati, 7
Viburnum, 398
  discolor, 398
Vigna, 370
  repens, 370
Viguiera multiflora var. genuina, 422
  Shrevei, 421
Vincetoxicum, 387
  adenocardium, 267
  belizense, 268
  chihuahuense, 270
  Gentlei, 269
  Hatchii, 269
  LeSueurii, 270
  nummularium, 270
  Pittieri, 270
  porphyranthum, 387
  quercetorum, 271
  trichoneuron, 388
  tristiflorum, 272
Violaceae, 378
Vismia, 377
  guianensis, 377
Vitaceae, 375
Vitis, 376
  tiliifolia, 376
Vittaria, 310
  dimorpha, 310
  filifolia, 310
Vochysiaceae, 265
Vochysia hondurensis, 265
  tabascana, 265

Wasiki, 195
Wedelia, 405
  parviceps, 405

Xylosma, 378
  Hemsleyana, 378

Yerba del indio, 239

Zanthoxylum, 371
  limoniodorum, 371
  microcarpum, 371
Zexmenia, 405
  aurantiaca, 407
  frutescens, 405
  perymenioides, 405
Zingiberaceae, 324
Zornia, 371
  diphylla, 371

I.A.R.I 75.

INDIAN AGRICULTURAL RESEARCH INSTITUTE LIBRARY, NEW DELHI

Date of Issue	Date of Issue	Date of Issue

GIPNLK—38/JDIARI/60—25-4-61—400.